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ABSTRACT

Eighteen interrelated, sequential lesson plans and supporting materials for teaching computer literacy at the elementary and secondary levels are presented. The activities, intended to be infused into the regular curriculum, do not require the use of a computer. The introduction presents background information on computer literacy, suggests a process for developing a unit, describes the organization and design of the lesson plans, and recommends steps to take prior to teaching the first lesson. Each lesson plan includes: indication of relevant curriculum areas; objectives; relationship to computer literacy; teaching suggestions; teacher preparation; materials needed; time required; prior skills needed by students; teaching activities; guided practice; independent activities; extension suggestions; and evaluation suggestions. Among the topics included are robots, history of computers, computer graphics, how computers work, vocabulary, programming languages, advertising techniques (analyzing computer ads), and computer components. The table of contents lists the appropriate grade levels and the relevant curriculum areas (language arts, social studies, mathematics, careers, art, and consumer education) for each lesson plan. Lengthy appendices provide supporting materials for the activities; a 27-item annotated bibliography of books and articles on computer literacy, computer programming, and improvement of teaching strategies; a list of four computer magazines for teachers; suggestions for finding human resources; and a blank lesson plan sheet. (DC)

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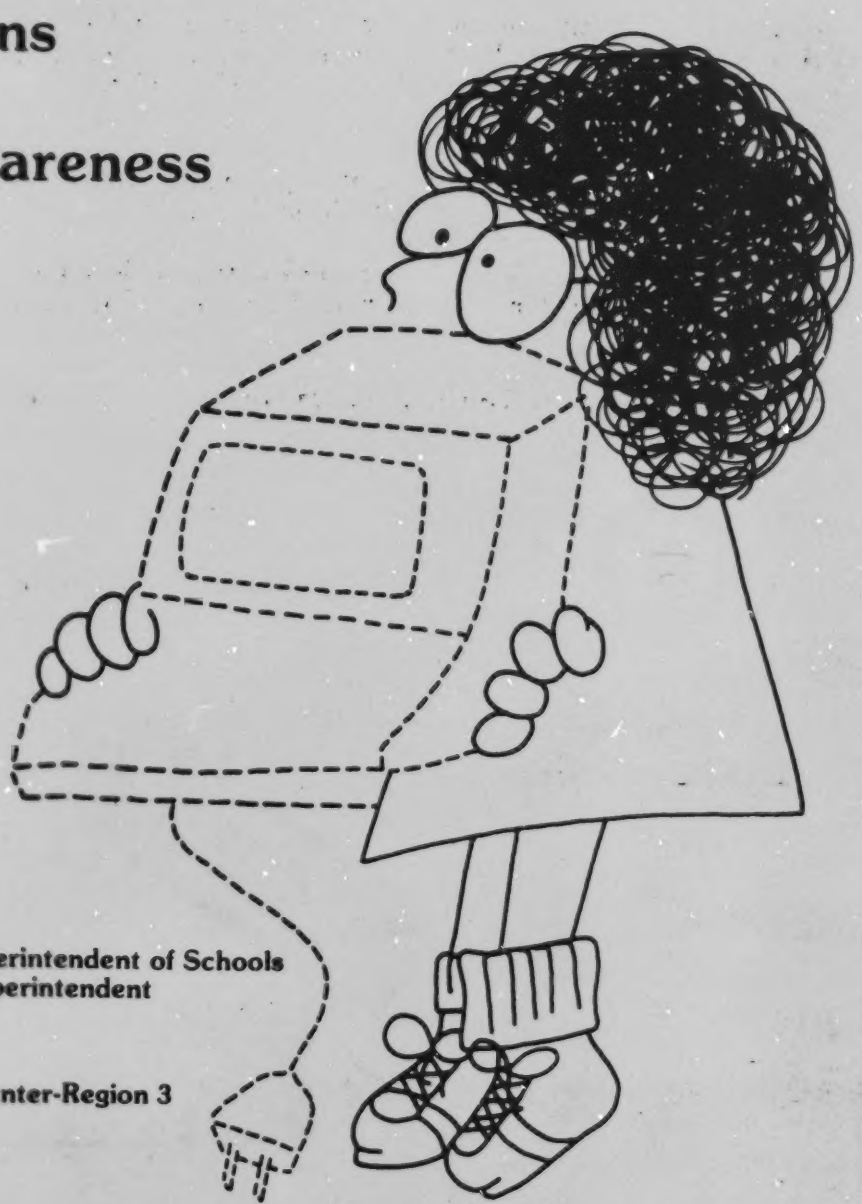
Computers In *My* Curriculum?

18 Lesson Plans For Teaching Computer Awareness *Without* A Computer

Adaptable Grades 3-12

Suzanne Powers Bailey
Marcia Jeffers



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Fairfield, California 94533

Teacher Education/Computer Center-Region 3

May, 1983

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Marcia Jeffers, teacher and school-level computer coordinator in the Vacaville Unified School District, was hired as a consultant to help in the development of the guide. Her assistance and support were essential to the project.

The first set of lesson plans was field-tested by 27 classroom teachers and special education resource teachers with students in grades 2 to 8. Their suggestions and evaluation comments were critical in the refining process. Their honesty, willingness to help, and enthusiasm for the project were much appreciated.

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The continuing support and assistance from many sources helped make this guide a realization.

Suzanne Powers Bailey
Curriculum Coordinator

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Preface

There is no substitute for a good teacher. Finding better materials, more effective strategies, and new tools to help teachers do their job better are part of the quest to improve the quality of education for all students.

A rapidly changing technology is providing teachers and students with a variety of new tools to help in this quest. One of these tools — computers — is generating a great deal of excitement and at the same time, some concern.

Teachers are currently faced with learning new and rather technical skills and content with limited access to computers. Materials often assume a high level of expertise and there is sometimes a noted lack of teaching methodology and practical applications. Couple these with an already crowded curriculum and the concern escalates to anxiety.

This guide was developed to address some of these very real concerns. Hopefully, it will be a safe and valid "starting place" for teachers just beginning to teach computer literacy and a valuable resource for those already involved in that effort.

New technology can assist us; however, we have not discovered a substitute for a good teacher.

Bill Chadbourne
Superintendent

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Introduction

Introduction — An Overview

This guide was designed for a specific purpose and audience - to [redacted] TEACHERS with a starting place for teaching COMPUTER AWARENESS.

The lesson plans in this guide are unique in the following ways:

1. The activities are embedded in the regular curriculum. No additional computer awareness "layer" (course or daily time slot) is needed. They introduce new content material as a way of practicing other kinds of skills appropriate to different grade levels. They are not designed as a course of study.

2. No computer is required to complete the activities. The lesson plans can be used readily by educators with limited or no access to computers. They can also be used by educators with ample access to computers as a non-keyboarding supplement and as a way to integrate computer awareness across the curriculum.

3. Minimal computer awareness on the part of the teacher is assumed. Background information and friendly "how to" instructions help the newcomer to instructional computing. The computing veteran can use and expand the lessons by varying the level of complexity, plugging in different resources and using the extension suggestions.

4. The activities are adaptable for both elementary and secondary age students. Suggestions are made in the lesson plans for alternate approaches and modifications for both very young and more sophisticated students.

5. Each lesson plan is composed of 14 elements and patterned after the instructional skills improvement efforts currently emphasized in many California schools - Madeline Hunter's research and Project R.A.I.S.D. training. This design is intended to complement local improvement efforts and reenforce these instructional strategies.

6. The lesson plans are sequentially arranged and interrelated so that they unfold from simple to complex and build one upon the other. They may be used as a complete unit in the order given over a period of months, or teachers may use individual lessons as isolated activities if there is insufficient time or interest in using the entire series.

GENERAL OUTCOMES

Each lesson plan has specific objectives, but the guide is also focused on some general outcomes for both teachers and students.

After using the lesson plans to teach the computer awareness activities, it is hoped that teachers will:

* be better informed about computer-related issues.
* have a wide range of successful experiences and resources to draw upon for future awareness instruction.
* be increasingly interested and comfortable in teaching about computer-related topics.
* go on to use the other resources suggested in the back section of the guide.
* involve others at the local level in sharing resources and planning other computer literacy activities.

Students who have experienced the lesson plan series of activities will, hopefully, have:

* an initial awareness of the ways computers touch and change our daily lives
* a beginning introduction to computer history and vocabulary.
* a basic understanding of how computers work and the types of problems they can help us to solve.
* some background knowledge on a variety of computer-related topics.

Computer Literacy — Thoughts and Myths

Computer Literacy — A Definition

A number of computer experts and educational agencies have defined computer literacy. They tend to speak of it in two ways - what the students' literacy looks like as an end product and what we, as educators, should be doing along the way to guide the students' experiences at each level to achieve that end product.

As educators, we create daily experiences for our students over a span of years which we hope will result upon graduation in students who are well informed, educated, able to read and write, and prepared to be productive and successful members of society. With the increasing role of technology in today's society, students need as a part of that end product a basic core of computer knowledge and skills.

To define that core of computer knowledge and skills is now the task of teachers, parents, administrators and boards of education. Like other types of literacy, computer literacy is the product of both the home and the culture and the educational experience provided by the school. Some components of the literacy core include:

- awareness about the computer's impact on society - how it is affecting and changing our lives.
- knowledge of computer operation - how to use and communicate with computers.
- ability to program a computer - to use it as a problem-solving tool.
- experience with computer-assisted learning - teaching and learning with computers

The components may vary with local educational priorities. They may also vary with individual student's abilities, interests, and in the type of career goals planned. Beyond the core of computer literacy, students may want to choose specialized learnings from the curriculum - additional computer languages, word processing skills, computer graphics, etc. Literacy components must be meaningful and useful to the students involved.

One of the shorter definitions of computer literacy states:

"Computer literacy is the ability to function in a computer and technology-oriented society. 'Function' means an understanding of computers and their applications, as well as skills in communicating with computers."

T.I.E.S., Minnesota Computing Consortium Guide, p.13

Introduction, cont'd

The implementation of a curriculum which would lead to this requires teachers who are computer literate to lead the way. In some schools, teacher computer literacy is nonexistent or the sole responsibility of a very few. This guide was developed to help build up the level of teacher literacy and more evenly distribute that responsibility.

The lesson plans are not in themselves a scope and sequence model for computer literacy. They do not have embedded within them a variety of computer-related topics, issues and basic learnings. They include:

- computer graphics and games
- computer history and vocabulary
- computer components and functions
- computer applications and careers

They are designed to be introduced in different subject areas for two reasons:

1. So that teachers and students begin to perceive the broad range and powerful potential of the computer as a learning tool with applications across the entire curriculum.

2. So that the responsibility and privilege for teaching computer literacy are shared among many teachers and students.

Hopefully, teachers at the school will share the activities in these lesson plans and increase their own literacy level as they teach their students.

With increased knowledge about computer literacy, the complex task of developing a local scope and sequence computer curriculum is more realistically accomplished. Members of a district committee or task force who have been charged with this task can benefit by looking at products already developed by other districts - Cupertino School District, Los Alamitos School District, the T.I.E.S. Minnesota Computer Consortium, etc. Tailored to many local variables - access to hardware and software, teacher literacy level, budget priority - the scope and sequence is sometimes best delayed until a district plan is developed to cope with these variables. Albany School District in concert with the Alameda County Superintendent of Schools Office developed such a model for planning. Resources exist to help educators understand computer literacy and the issues and problems in trying to define it. Some of these are listed in the "Resource Materials" section at the back of this guide.

Defining computer literacy - the end product, the scope and sequence curriculum and the implementation plan - is a complex process. It is further complicated by the rapid pace of a changing technology which antiquates specific skills almost before they are placed in a scope and sequence model. The end point must be fluid enough to absorb the visions which technology has yet to bring into reality. Experts, nationally as well as locally, are struggling with these issues. This guide can be an interim step while that process is underway.

COMPUTER AWARENESS - Possibilities and Limitations

This guide was developed as a response to teacher requests for activities to teach students about computers. The lesson plans attempt to teach those aspects of computer literacy which don't require "hands on" access to computers. They allow teachers to begin immediately to help students acquire beginning level computer knowledge regardless of the access to computers.

This strand of computer literacy is commonly labeled "computer awareness." While these activities contribute to the literacy level of students, they cannot substitute for the keyboard experiences or computer programming strand which students need to master the full range of literacy skills. Just as the classroom activities of a driver's education class set the stage for the actual driving experience later, these awareness activities are an important piece in preparing students for future computer operation experiences.

Teaching Computer Awareness — The Rationale and the "Pay-Offs"

The rationale for teaching computer literacy is tied up in the end-product nature of education - helping students become successful and productive members of society. The main supporters of computer literacy are the industries which employ our students and parents who hope that their children will be gainfully employed and successful upon graduation. Depending on which newspaper or magazine article you've read recently, between 55%-85% of the jobs by 1985 will involve computers. The pressure to prepare students for this projected job market has received both state and national attention. There are new proficiency requirements for computer literacy, increased math and science coursework and tax breaks in California for computer companies donating hardware to schools. Parents have also been a moving force in providing hardware to schools, either through fund-raising efforts or direct donation. Depending on the source, they have been responsible for providing from 42% to 52% of the computers for the nations' schools. Success in the real world upon graduation - new skills to live in the electronic age of information and communication - is the rationale for teaching computer literacy.

There are "pay-offs" in this effort for you as an educator. Computers are a high-interest topic for students, and motivation to learn about them is usually very high. Likewise, many teachers have a chance to explore a new area, and this exploration process can give a spark, a new outlook, to a "tired" area of the curriculum. The excitement and enthusiasm from computers can carry over into other areas of the curriculum and open doors between grade levels and departments. Computers touch everyone - banks, grocery stores, airlines, etc. - and experiences can be shared and built upon. Because of technologies' rapid developmental pace, it takes a group effort - teachers, parents, students and other community members - to keep up with the changes. It's a way to learn together and from each other. This type of atmosphere can change the learning environment and expand the responsibility for computer literacy education. This kind of inclusive participation can be a major "pay-off."

The Computer Phenomenon— A Perspective

Technology and the use of computers is not an educational fad which will go away. It's a societal trend that will change and grow. Some people are unwilling or unable to grasp this point and, therefore, unwilling to change or even support those who are attempting to learn new skills and become part of the computer phenomenon. Keeping this perspective of change - to learn new skills, to learn new ways to communicate and manage information and to try to see into the students' future world - is easier if you can focus on some unique aspects of the computer phenomenon.

1. It is a "grass roots" movement. Many teachers have owned computers for years and have been bringing them to school even when no school-owned computers were available. They see benefits in educational applications and have ventured into a self-help learning program to become more skilled.

2. The pressure to teach computer literacy started from outside education - industry and parents. Many students are becoming computer literate using a home/personal computer or attending private computer camps. They are becoming literate outside of the public education system.

3. The computer is a watershed invention like the light bulb, the printing press and the automobile, having tremendous societal impact. It daily changes our lives and will continue to shape it in ways we cannot conceptualize.

4. It is a great "leveler" or equalizer among groups. There is equal or reversed lack of knowledge among groups within the community. This has the potential of breaking down traditional learning roles and barriers through peer learning situations between students, parents, teachers, members of the community, school board members and administrators.

Introduction, cont'd

5. It similarly provides common interests, problems and enthusiasm between the home, the school and business community, and provides opportunities for problem-solving and planning joint-venture projects which have potential carryover to other areas.

6. There is potential impact for ALL students across the ENTIRE curriculum, and it can provide a common basis for school-wide planning and communication.

Appreciating the uniqueness of the computer phenomenon allows you to change more effectively and help those around you adjust more positively to it. Some of the lesson plans incorporate these aspects of change. If these are aspects which appeal to you, seek out those activities and build upon them.

Some Myths and Obstacles — Removed

With the onset of a major change comes excitement, enthusiasm and hope for ways this change will make improvements. It also brings to some the fear that things will change for the worst and anticipated discomfort in having to give up comfortable old ways for something unknown. This anxiety, when coupled with a lack of information, creates obstacles and reason to avoid participating in the change. Some are real, some mythical. Some obstacles and myths about the computer phenomenon are perpetuated by educators and further complicate computer literacy efforts.

Some of the myths and obstacles associated with computers in education could be dispelled or removed by providing additional information or dealing with them as part of an implementation plan. Some of the more popular myths and obstacles are listed below. They are presented here as a way of beginning to share the responsibility for their removal. As you look them over, you may recognize some that are being perpetuated in your school.

MYTH #1. "I'm not getting involved with instructional computing because... computers are too hard. You have to know how to program to use a computer."

Computer programming is NOT a prerequisite to using a computer for instructional support via commercial software. A four to eight hour inservice session can adequately start a teacher in the use of simple C.A.L. (computer-assisted learning) software in the classroom. If interested and inclined, teachers may then choose to attend additional inservice sessions - software evaluation, curriculum implementation, etc., which may or may not eventually include a computer language such as LOGO, PASCAL, BASIC, or PILOT.

MYTH #2 "Computers belong with the math teachers. I teach _____ so they don't concern me."
(reading, English, social studies etc.)

While a math background enhances computer programming/computer science coursework, computers are a tool for managing information of all kinds. The predominant skills for communicating with computers are language related - writing, reading, thinking.

MYTH #3 "I've been teaching for ___ years and I've done fine without them. I don't need to be involved."

Perceiving computers as an isolated, irrelevant issue, an avoidable education fad which will go away if ignored, or a tool without professional or personal value are postures which may be based on a lack of information about the magnitude of the computer's impact on society - present and future. Given the pace of technology,

even those who understand the potential of computers have difficulty conceptualizing and processing what life will be like in the future. It's no wonder that those who have no experience or understanding about how today's computers can help us personally or professionally fail to see its importance for students. Examples of how other major inventions have revolutionized society may help convince them. The incentive to change twenty or more years of teaching "habits" varies from person to person. Some educators may need to see the ways in which the computer can help them personally - better record-keeping, faster word processing of parent reports and notices - before they will examine its impact on the student's world. Never having to make up drill and practice quizzes/tasks, vocabulary crossword puzzles for reading, science, social studies, etc. may be incentive to get involved.

MYTH #4 "Our district/school doesn't have money for hardware, training or software so we aren't getting involved yet."

Some aspects of computer literacy can be done in phases which require little or no expenditure. Committees and study groups can meet and share information for planning so that direction is established. Teachers can begin reading independently to become more knowledgeable about computers through a subscription to a computer magazine or membership in a computer organization. Administrators can begin to talk with administrators from other areas who are using computers about potential costs and funding. Involvement from the community, parents and students can help in the development of a plan to address problems associated with instructional computing.

MYTH #5 "There aren't enough materials or time to teach computer literacy."

An already crowded curriculum and a busy teaching day have little extra room in them for yet another subject layer. Finding ways to integrate computers into the existing curriculum is one alternative. Student computer materials were once scarce and written in electronic jargon suitable only for college computer science majors. Materials are now available which are targeted to literacy topics and appropriate for even very young students.

There are other myths and obstacles. You may have heard some at your school. Behind each one is genuine concern about the change process and how computers will affect teachers, personally and professionally. You can play an active role in answering that concern. By sharing magazine articles with accurate information and extending invitations to others to go with you as you seek training, you can become a positive change agent for instructional computing.

The Attack Plan — A Process Suggestion

The process of preparing a NEW teaching unit is similar for most teachers, even at different grade levels or for different subject areas. You have certain steps that you go through - some of them so automatic and intuitive that you may not even think about them as you do them. Whether it's a new unit on nutrition, oceanography, grammar, South America, the metric system, or aerobic exercise - the process that you go through to create the new unit is similar.

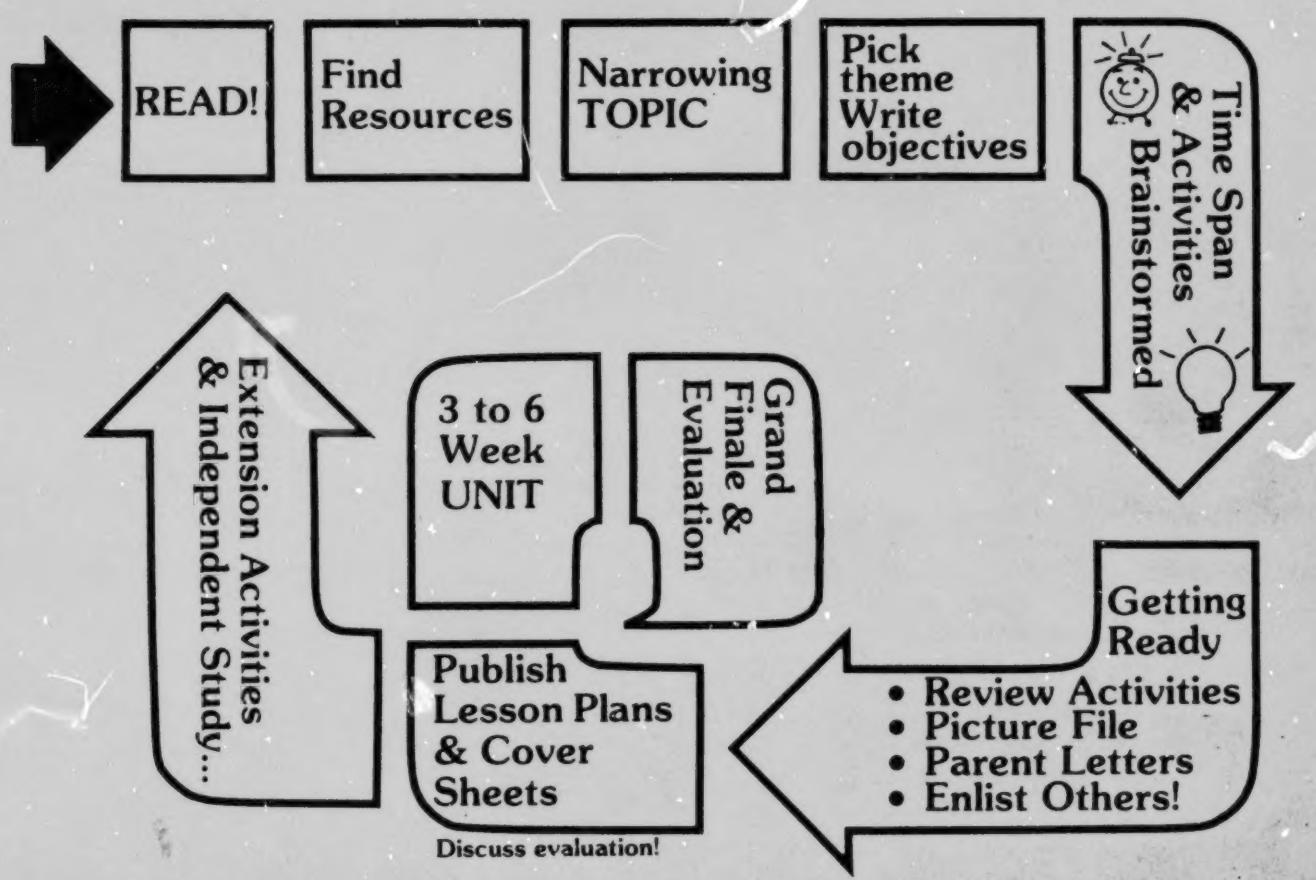
Think of the last NEW unit you created for your students, one about which you had little or no previous knowledge. Try to remember what you did first, second, third, etc., to prepare that unit of study. You have your own "attack plan" for managing new information. You go through the process of learning it yourself, selecting certain parts and then organizing them into teaching activities.

Introduction, cont'd

The Attack Plan below is a picture of one person's process for preparing a new unit of study. As you look it over, compare it to the steps YOU go through and note the similarities and differences.

ATTACK PLAN

INFORMATION MANAGEMENT



You may have found steps which you don't normally include in your unit-planning process - or you may include more steps. New or unfamiliar topics seem to require a more organized and comprehensive planning process. If teaching about computers is a new experience for you, you may find this attack plan helpful in thinking about how you will want to organize and use the lesson plans in this guide with your students.

The Planning Process — Attacking the "Unknown" Content

Teaching students about computers requires an attack plan. Before you begin using the lesson plans in this guide, consider how you could best organize the information for your students. You may want to select some lesson plans and create your own unit of study on computer awareness. If you already have computers, you will want to pair the lesson plans with other keyboard activities which have students practice or apply what they have just learned. Your attack plan personalizes the lesson plans in a prescriptive way for your students, your learning environment and YOUR literacy level.

In beginning to plan how to use the lesson plans in this guide, consider using the ATTACK PLAN. The steps which follow were used to develop an initial six-week unit of study for students (grades 4-8) who were reviewing LANGUAGE ARTS and SOCIAL STUDIES skills. Students and teachers had little or no knowledge of computers and even though hardware was ordered, there was no current access to computers. This is one example of how to adapt the lesson plans into your own computer awareness unit.

To get the "big picture" of an unfamiliar topic, most teachers rely on a teacher's manual and an overview in some type of reference material. This guide can be used as both. The overwhelming recommendation of teachers who field-tested the lesson plans was to take time to read ALL of the guide BEFORE using any of the lesson plans.

Another way to get an overview of computers is to read a book from the last section of the guide, "Resource Materials." One of the general information books such as Computers for Everybody would be helpful, not overwhelming, and provide a background for planning.

Find Resources

Next you will want to find teaching resources close at hand. The library and media center may have computer-related materials for you to use. You will want to incorporate them into your unit. Find out who else in your school and community is interested in computers and draw them into the planning. Some ideas for doing this are outlined in the section, "Other Resources and Sanity Savers," at the back of this guide.

Like other teaching units you may have prepared (endangered species, World War I, American Indians), the information you find may be interesting but may not be matched to the ability level of your students. You may need to do some translating and rewriting for them. This is especially true for the electronic jargon of computer articles and movies. Almost a foreign language, vocabulary development will be critical in using some resources.

Narrowing TOPIC

The scope of computers is enormous. The lesson plans in this guide deal with only a small number of possible topics associated with the beginning level of awareness. If this is your first experience in teaching about computers, you will want to choose several activities you feel you could teach comfortably and successfully.

In this unit, Lesson Plans #1, #4, #6, and #10 were selected for the students as the basis for the first unit of study.

Introduction, cont'd

Pick theme Write objectives

To set the selected lesson plans in a meaningful learning sequence, other activities may need to be developed. Given your students' abilities and interests, you will want to select a theme and write objectives to form a cohesive unit of study.

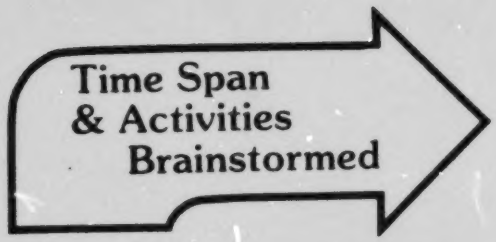
The theme and objectives chosen for these four lesson plans might resemble these:

The Theme: "COMPUTERS TOUCH OUR LIVES"

Goal: Students will explore ways which computers touch and change their lives and the community in which they live.

By the end of the unit, students will:

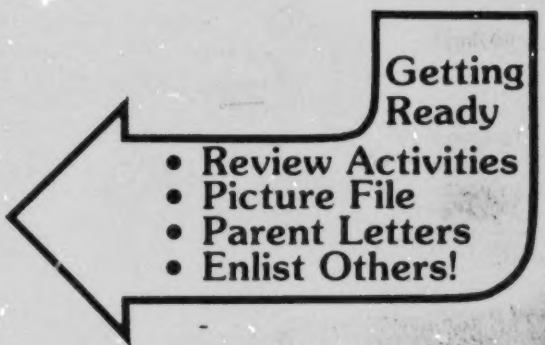
1. be able to collect, organize and summarize data in graph format regarding local business use of computers.
2. be able to name 5 careers related to computers - discussing one in-depth from interview information.
3. be able to explain 5 ways computers touch our lives and how they change the way we live.



Adapting the Lesson Plans

The time span alloted for this unit was about six weeks. Activities were structured so that students worked about an hour and a half each day including independent study. These include some activities with which students were already familiar - keeping a daily journal, working in small groups and recording their assignments and grades on assignment sheets.

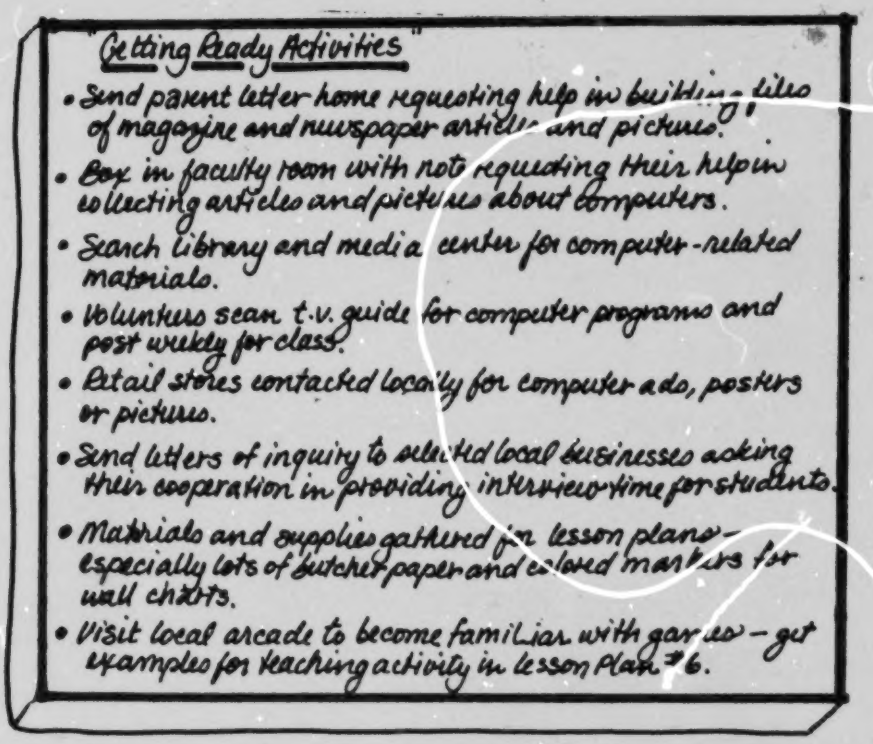
At this stage, the elementary teachers (grades 4-6) and the junior high teachers (grades 7-8) began to adapt the lesson plans differently to fit the interests and curriculum for their students. Modifications were made in the types of tasks, the time span of the daily lessons and the type of evaluation to be done at the end of the unit.



Getting Ready — A Team Effort

Before you start the unit, students and parents can help in the "getting ready" process. The building of picture files and magazine article collections and the scanning of t.v. programs for appropriate computer-related shows can be done by everyone. This allows you time to concentrate on other kinds of

preparation tasks. "PRE"-unit activities for the "Computers Touch Our Lives" include:


"Getting Ready Activities"
• Send parent letter home requesting help in building files of magazine and newspaper articles and pictures.
• Box in faculty room with note requesting their help in collecting articles and pictures about computers.
• Search library and media center for computer-related materials.
• Volunteers scan t.v. guide for computer programs and post weekly for class.
• Retail stores contacted locally for computer ads, posters or pictures.
• Send letters of inquiry to selected local businesses asking their cooperation in providing interview time for students.
• Materials and supplies gathered for lesson plans - especially lots of butcher paper and colored markers for wall charts.
• Visit local arcade to become familiar with games - get examples for teaching activity in lesson plan #6.

Publish Lesson Plans & Cover Sheets

Discuss evaluation!

Getting Organized — The Secret to Success

When the unit has been mapped out and the weekly schedule of daily activities has been developed, consider the advantages of making a copy of this master lesson plan for each student. This helps students know where they are headed and what to expect. It can help students become more independent learners and more accountable for their time. It also relieves you of the constant responsibility of "directing traffic" to the next task.

At the end of each week, students can use their copy of the master lesson plan schedule to record their grades and as a cover sheet for completed assignments as they are returned and paper-clipped to it. Comments can be added by you and the packet sent home with the students for review by parents on Friday. Parents sign the sheet and record any comments, and students return the packet on Monday. Computers are of interest to many segments of the community. Reviewing student work may create parent interest in helping with the rest of the unit!

MASTER LESSON PLAN for Erin Mullane — Mr. Leonard. Social Studies Rm. 12.
WEEK #1 "COMPUTERS TOUCH OUR LIVES" Oct. 1 → 5

MONDAY	TUESDAY	WEDNES.	THURS.	FRIDAY
___ Review how to work in small groups Group members: ___ ___ ___ ___ Interview others - with 6 questions ___ Note-taking Activity #1	___ Review dictionary entries (lecture/note-taking) ___ 5 computer definitions ___ Cover and contents started on dictionary	Movie: "Careers in Computing" ___ Notes ___ Small group makes interview questions ___ 5 more computer definitions QUIZ: Definitions	½ small groups interview Mr. Larson from P.G.E. data bank ☐ (20 min.) ½ small groups work on "Giving Good Directions" (20 min.) ☐	½ small groups interview Ms. Green from Basic Vegetable Comp. ☐ (20 min.) ½ small groups How to Make a Peanut Butter + Jelly Sand. (20 min.) ☐
Homework: Select T.V. Logic - program	Computer Journal (2 pgs)	Add to picture file	Refine interview notes	Refine notes and directions

Introduction, cont'd

3 to 6 Week UNIT

A sample of the master lesson plan for the unit on "Computers Touch Our Lives" may give you some ideas for designing one of your own:

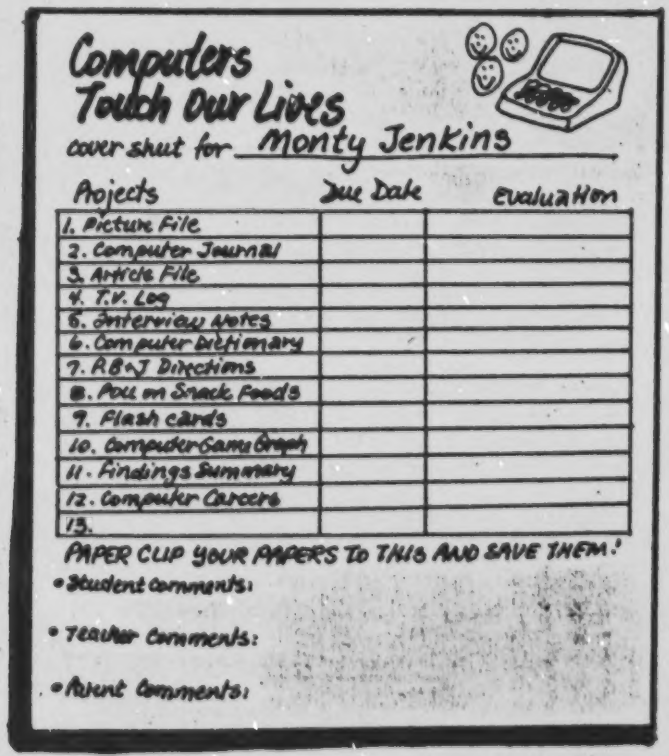
MASTER LESSON PLAN SCHEDULE FOR Michelle Ryan

"Computers Touch Our Lives" October 3 to 28th Mrs. Hurley's Class, Rm. 3

- Getting Ready Activities (Sept. 26-30)
  - ___ Picture File
  - ___ Article File
  - T.V. Program watched ___
  - Computer Journal ___ pages
- Moving Ahead Activities (Oct. 31-Nov 4)
  - Activity I would like to work on: ___
  - Describe project due Nov 4: ___

Week #1	Week #2	Week #3	Week #4
Group members: ___ ___ ___ List of interview questions ___ Note-taking exercise ___ Instruction for Peanut Butter & Jelly Sandwich ___ 5 definitions for Computer Dictionary	___ Complex directions for ___ ___ Practice bar graphs and circle graphs ___ Practice taking a poll on favorite snack foods ___ Make set of flash cards for computer dictionary definitions	___ Phone interview notes onto wall chart ___ Take poll on favorite computer game ___ Graph results of poll ___ Write summary of findings ___ Write a statement to explain findings (why?)	___ List of statements about computer careers from wall chart. ___ "What if..." paragraph about how computers make our lives different ___ Add rest of definitions and flash cards to computer dictionary (total 15)
Comments: Student ___ Teacher ___ Parent ___	Comments: ___ ___ ___	Comments: ___ ___ ___	Comments: ___ ___ ___

For younger students, a separate cover sheet was developed for each week's work and folders were used to accumulate the entire unit's work. This reduced the possibility of a student losing a major chunk of their computer unit. A sample cover sheet looked like this:



Computers Touch Our Lives

cover sheet for Monty Jenkins

Projects	Due Date	Evaluation
1. Picture File		
2. Computer Journal		
3. Article File		
4. T.V. Log		
5. Interview Notes		
6. Computer Dictionary		
7. R&J Directions		
8. Poll on Snack Foods		
9. Flash cards		
10. Computer Game Graph		
11. Findings Summary		
12. Computer Careers		
13.		

PAPER CLIP YOUR PAPERS TO THIS AND SAVE THEM!

- Student comments:
- Teacher comments:
- Parent comments:

Grand Finale & Evaluation

At the end of the unit, students will have learned a lot about computers. Some type of experience which helps students reflect on their new knowledge and skills will bring the unit to successful closure.

Students can participate in the evaluation process as you elicit and record their responses on large butcher paper on the blackboard. Questions like:

* What do we know about computers?

* What was the most surprising thing we learned about computers?

* What skills did we practice as we learned about computers?

* Which activities did you like the best? the least?

* What else would we like to know about computers?

Depending on student ability, they can then compose lists, paragraphs, essays or pictures summarizing their own learnings by selecting items from the information recorded on the board or butcher paper.

Other types of grand finale events or evaluative exercises for the unit on "Computers Touch Our Lives" include:

Grand Finale
and Evaluation Ideas

- Dictionary BINGO with computer dictionary terms
- "Guess My Line (career)" game Show questions for computer careers
- "Programming a Robot" Teams write programs for tasks - best directions win...
- Students write lists of "What I know about computers..."
- School-wide poll, graphs & summary on a computer issue.

etc!!

Extension Activities & Independent Study...

Over the next few weeks, students can continue to build on their new learning by exploring other areas of interest or even continuing activities already started. For this unit, those activities included:

Extension Activities and Independent Study "Moving Ahead Activities"

- At the end of each lesson plan, choose a few appropriate activities as options for students to work on during the following week. Students select an activity and sign a work contract.
- Continue to expand the Computer Dictionary.
- Arrange a walking field trip to a business using a computer. Most fast-food chains now use dedicated computers (Straw Hat Pizza, etc.) to record orders, cash, work time for employees, etc.
- ETC.!!

After the first unit about computers, other lesson plans can be selected from the guide and other units created to match student interests.

Teaching All or Some of the Lessons?

There are other approaches to using the lesson plans in this guide. If there is sufficient time and priority, the lessons may be taught as a series in the sequence given over a period of months. They may also be selected and taught out of sequence as individual lessons as time permits.

The Guide — Organization and Design

The Four Parts of the Guide

This guide is made up of four sections:

1. The Introduction is designed to give an overview of computer literacy and organizational ideas for using the lesson plans.

2. The Lesson Plans provide detailed information and instructions for teaching 18 different lessons in computer awareness.

3. An Appendix section supplies additional materials - instructions, sample charts and lessons, directions and ideas.

4. The section on Resource Materials for "Next Steps" gives lists of books, materials, organizations and other resources to learn more about teaching computer awareness.

Lesson Plans — Fourteen Elements

Each lesson plan is broken down into fourteen pieces or elements and laid out in a two-page format. These elements form a step-by-step process for teaching the lesson. A description of each lesson plan element is given below as a way of preparing you to use them more easily.

Curriculum Areas

These are the existing areas of the curriculum - skills and concepts - which may be used to introduce a computer awareness topic. Letter writing, math facts, review work or advertising techniques may already be designated for your students' course of study for the year. By using computers as the content or medium of the skills practice, two lessons may be accomplished at the same time. This embeds computer awareness across the curriculum and avoids creating an additional layer of content. It also allows teacher literacy and comfort to develop a little at a time, transferring other successful teaching strategies into the new content area.

Objectives

These are brief indicators of what the activity will help the student learn or practice. There are often several objectives per lesson plan - each one needing to be broken down by the teacher into tasks appropriate for particular students and the learning situation.

How This Activity Relates To Computer Literacy

Here you will find a description of how the individual lesson plan contributes to the student's total understanding of computer literacy. This element should help you answer the question - "Why do students need to know this?" This information can be rephrased and used with students to introduce the lesson and set the stage for the coming activities. It can also be used at the close of the lesson to summarize what has been learned or to lead into other extension activities.

Teacher Options

These are some possible ways to BEGIN to adapt and modify the lesson plan to fit your teaching situation. They are meant to be only a starting place for planning alternatives. Other ideas can be found in the last element, "Extension Suggestions."

Materials

One of the "getting ready" tasks will be the gathering of materials and supplies to use in the lesson plan. A list is given here of materials, both needed and optional, so that you can requisition or collect items not normally used in your classroom. You may choose to make substitutions, additions or deletions. More information on this may also be listed in the next section, "Teacher Preparation," or in the appendix.

Teacher Preparation

These are the organizational steps in preparing to teach the lesson - demonstration materials and samples, duplication of materials, examples to use in teaching and background reading. Additional lesson ideas and student materials for this step are found in the appendix.

Time

This is a suggested time span for completing the lesson plan. Included is both activity time (minutes/hours) and the lesson plan time (days). These are rough estimates included only as guidelines. You will need to arrange the lesson plan to fit your time schedule and learning situation.

Prior Skills Needed By Students

Indicated here are skills which will enable students to complete the lesson plan activities easily. A quick review of them prior to the lesson would increase the student success rate. If completely unknown to students, these skills need to be taught prior to this lesson plan or taught during the teaching activity. This is the last step of preparation.

Teaching Activity

Now the actual instruction begins. As the activity begins, it's helpful to find out what students already know about the topic they are going to study. You can use the information from the earlier element, "How This Activity Relates to Computer Literacy," and, hopefully, connect the new topic to something in the students' world or past experiences.

This element of the lesson introduces students to new information and the task to be done. This can be done by teacher explanation or demonstration, discussion, films or video, books or magazine articles. As you conduct this part of the lesson, check often by asking questions to make sure students are understanding the facts and issues. You may visually model or demonstrate what students are to do. Have them explain or restate critical learnings before you go on to the next step. Reteach any unclear areas at this point.

Guided Practice

After the initial instruction, students now have a chance to perform the activity under your supervision so that you can answer questions and reteach individually any students who experience difficulty. When individuals or small groups of students demonstrate success with the activity, they may go on to the independent activity.

Independent Activity

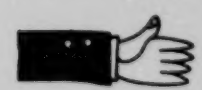
Once the initial activity has been mastered, students may now work on their own to complete the original activity or begin a second, but related, activity.

Sharing

These are suggestions of ways students can learn from each other by exchanging ideas and information. At the same time, they can get feedback about their own projects and reinforcement about their new learnings.

Evaluation

This section indicates ways the teacher might evaluate student progress in mastering the objectives for the lesson plan. Since many of the lesson plans are process-oriented, teacher observation of student behavior is a frequent evaluation strategy. Teachers who use a reward or behavior modification system and those who use a point system for grading will want to consider at the beginning how the activities will be evaluated.



Extension Suggestions

Given student interest and available time, here are additional ideas on related topics for further study. They may be attempted by the whole class or used as independent projects by individual students.

The Methodology

The lesson plans are designed with certain teacher behaviors in mind. The elements of the lesson plan are structured after the Madeline Hunter and Project R.A.I.S.D. teacher training approaches. Both of these programs are designed to improve teachers' instructional skills. Books and materials on these approaches are listed in the "Resource Materials" section of the guide.

Another teaching strategy referred to frequently in the lesson plans is the creation of large (6' x 8'?) wall charts made of white butcher paper to organize and record information gathered by students. These "retrieval" charts serve as a giant group memory or data bank. With a good questioning strategy, the teacher can help raise students' thinking skills. Students can look at the completed information and learn to see similarities, differences, patterns and trends. They can also begin to make generalizations and inferences about data. Additional information on this strategy is also given in the "Resource Materials" section.

Getting Started — *Before* You Teach the First Lesson

The Field-testers Speak Up!

During the field testing of the lesson plans, teachers were asked to keep track of suggestions for successfully using the guide. A variety of suggestions was gathered. The predominant ones are shared here with you.

1. Allow ample time to read the ENTIRE guide (front to back) before using any of the lesson plans.

2. Tailor the lesson plan to fit your teaching situation.

3. Don't go too fast trying to cover all of the lesson plans in a short period of time. Building on a successful lesson by using some of the extension activities may be more productive than starting another new lesson plan too quickly.

4. Involve students, parents and other teachers in the preparation and the activities. The enthusiasm is contagious and carries over into other areas.

5. Have an organized strategy for using the lesson plans. It will make it more meaningful for everyone.

Countdown Checklist

✓ 1. I've read the entire guide.
✓ 2. I have an "attack plan" for using several of the lesson plans.
✓ 3. I've organized a daily strategy over several weeks' time and made copies of it for students and parents.
✓ 4. I'm involving others in the preparation activities.
___ 5. I'm ready to use the first lesson plan!

Computer Awareness Activity

Curriculum Areas

Language Arts

- Following and giving directions
- Sequencing ideas

Objectives

- To be able to give clear verbal and/or written directions to complete a defined action or task
- To experience the problems created by poor computer programming/direction giving

How This Activity Relates To Computer Literacy

A computer program is a clear set of instructions to tell the computer what to do. To program a computer you must be able to write directions that are in the right order and make sure that you don't leave anything out. Computers do exactly what they are told - no more or no less. Problems with computers are a result of confusing directions given by the person who wrote the program.

Teacher Options

- Activities for the "robot" demonstration other than making a peanut butter and jelly sandwich. (How to eat an ice cream cone, drink a glass of water, boil eggs)
- Activities for robot pairs may include cupcake decorating, drawing a picture, etc., with a visual barrier between them which makes following verbal directions more difficult and/or humorous.

Materials

- Peanut butter, jelly, bread, knife
- Paper and pencils

Time

For teaching demonstration: 45 min.

For student activity: 1 hour

Time span suggested for this activity - 2 days

Teacher Preparation

- Gather materials.
- Practice writing a set of instructions for some of the tasks you will give your students to get a feeling for the difficulty involved.

Prior Skills Needed By Students

- Sequencing ideas and details
- Writing descriptive phrases

Programming a Robot 1

Teaching Activity

- Talk about giving instructions or directions. Brainstorm situations where students had to give this kind of information and list on board.
- Have students try writing out how to put on a coat (work in pairs) - and then have some tell you what to do as you try to do it per their SPECIFIC directions. At the end, point out missing or unclear information.
- Discuss key words that must be understood in order to do a task. Explain that computers respond only to words entered in their memory - they do not "understand" words they do not know. List the words you (the computer) will respond to in the sandwich-making exercise below.
- Have students refine their directions while you set up the materials for the next exercise.

Guided Practice

FOR THIS EXERCISE the computer "understands" left, right, up, down, forward, back, turn, move, hand, fingers, raise, pick up, spread, put down, and replace.

- Set up the ingredients and tools for making the sandwich.
- Choose a team of 4 students who will program the robot (you) to make the sandwich. Others watch as you follow their SPECIFIC instructions.
- At the end, discuss ways which made the directions easy or hard to follow. Errors in computer programs are called "bugs." List common "bugs" made in the program to make the sandwich.

Independent Activity

- Students work in robot pairs to write directions for 2 or 3 common tasks - shutting a door, sharpening a pencil, stapling a paper, etc.
- Point out that the new UNIVAC computer can program 25 million instructions a second!

Extension Suggestions

- Students can advance to more complex directions - changing a bicycle tire, taking care of a cut finger, mowing a lawn, doing the dishes - and exchange to check the programs for "bugs."

  Note: Words which the computer "understands" will vary with the activity.

- A study of cooking recipes for clarity - try "minimal preparation" ones in class.
- Have students begin directions with line numbers and end with return or run.
- Start Activity #10 now by using "bug" as the first word for their computer dictionary.
- Look in the Resources section of this guide to find books with "flow charting" information to introduce this concept as a way of solving problems.

- Students work in pairs to write directions.

Sharing

- Students exchange directions with other pairs and see if they can follow them.

Evaluation

Computer Awareness Activity

Curriculum Areas

Social Studies
- Inventions
- Concept of progress

Language Arts
- Reading
- Paragraph writing

Objectives

- To introduce computer history
- To understand why early machines were built, how they worked, and how improvements were made over the years

How This Activity Relates To Computer Literacy

Like other inventions, the computer was created to make things easier and faster. The computer has developed over many years. Just like us, it has a history and ancestors. Each ancestor was improved upon until today's computer is better and faster than those in past generations. Each ancestor tried to improve living conditions for people. Future generations of computers will continue to change our lives.

Teacher Options

- Show media on other inventions and the improvements made (car, phone, candle, washing machine, etc.) before discussing the computer evolution. Solano Co. I.M.C. has films: 1-518 Invention in America's Growth (1750-1850), 1-543 Inventions in America's Growth (1850-1910).

- Create a large "time line" on the wall and have students make a drawing and explanation of each of the computer's ancestors to tack to the time line.

Materials

- Copies of "Computer History" (See appendix.)
- Abacus or loom for demonstration - optional
- Encyclopedias or books ready for students to use in research on "computer ancestors."
- Look for Radio Shack ditto masters packet at your school. (See materials list.) Optional.

Time

For teaching demonstration: 30 min.

For student activity: 1 hour

Time span suggested for this activity - 3 days

Teacher Preparation

- Read history in appendix to determine difficulty level for students - if too difficult, read aloud.
- Gather encyclopedia or resource materials with pictures of early computers mentioned in the history.
- Create questions on board or paper for discussion of the computer history.
- Prepare a skeleton time line for independent activity. (Large wall chart)
  (Additional information on computer history is included in books on the resource list at the back of this guide - see books by Horn and Richman. You may feel better prepared after reading more background material.)
- Organize discussion on inventions for teaching activity.

Prior Skills Needed By Students

- Reading or listening skills to learn information presented
- Concept of time line
- Use of reference materials - writing a paragraph

Ancestors of the Computer 2

Teaching Activity

- Discuss some major inventions (light bulb, car, phone, t.v., etc.) and help students talk about why they might have been invented - usually to make a job easier, faster or better. Show movies if available.
- Trace the ancestors of some of these inventions (candle, horse/buggy, telegraph) and talk about problems with those that needed improvement.

Guided Practice

- Present list of questions about computer history - add questions students may have from previous discussions as they apply to the computer.
- Read aloud the computer history and/or distribute copies.
- Organize students into small groups to work on all questions or divide questions among groups. Groups report to whole class.
- Explain the skeleton time line and what's missing.
Review how to use reference books and materials to find information.

Independent Activity

- Small groups are each assigned a computer ancestor. Their task is to prepare a large picture and a written paragraph for the large wall time line. Paragraph should include inventor, problem it tried to fix, and way(s) the inventor may have improved our life style. Assign jobs to group members if necessary.
- Groups add their material to wall chart and share paragraphs with class.

Extension Suggestions

- Students research other inventions and report back to class. Add pictures and paragraphs to wall chart. Paragraphs should include:
  1) the problem the invention tried to fix
  2) ways this invention <u>may</u> have improved or contributed to our life style today.
- Students make an inventory list of inventions in their homes and write the two types of information above for each invention. They should star (*) those which they <u>think</u> are computer-related and verify in Activity #9. Extra points given to ancestors of each invention also residing in the house. (Electric can opener, hand crank can opener, etc.)
- Interested students can work on Radio Shack ditto masters, <u>Computer Literacy: Computers Past and Present</u>, or other resource materials.

Sharing

- Small group work

Evaluation

- Small group participation
- Completion of skeleton time line

Computer Awareness Activity

Curriculum Areas

Math

- Review

Objectives

- To introduce students to the calculator mode of the computer
- To review math skills chosen by teacher
- To compare human time vs. machine time to perform selected math tasks

How This Activity Relates To Computer Literacy

Over the years man has tried to develop ways to count things quickly. The abacus was an early invention to help count quickly. Cash registers, adding machines and calculators are machines we use today to help us with numbers. The computer can count quickly too, which makes it a valuable tool. In trying to understand how computers work, we can use a home calculator to compute basic math problems more quickly. It's also good to keep in mind that machines/computers don't make mistakes, but people do, and people control machines.

Teacher Options

- Selecting different review lessons with different math functions (+, -, x, ÷) depending on ability and familiarity with the calculator
- Grouping students or working individually at tasks
- Giving single or multiple problems at one time to students
- Using students as timers rather than group participants who are anxious about "timed tasks"

Note: This activity may be too difficult for younger students.

Materials

- Calculators (as available)
- Butcher paper for charts
- Stop watches for timing or use clock with second hand
- A review math lesson
- Paper and pencil for computation

Time

For teaching demonstration: 30 min

For student activity: 1 hour

Time span suggested for this activity: 1 day

Teacher Preparation

- Group students so that ability is equally divided.
- Collect calculators or have students bring them for the event. (WATCH SECURITY.)
- Cut a piece of butcher paper for each group to record their information.
- Select several math review pages of problems to suit the class ability. The problems will need to be copied/ calculated as they are recited by the teacher.
- Have answer key to those problems handy.

Prior Skills Needed By Students

- Basic math facts to perform review activities easily
- Simple operations on the calculator to fit chosen review activities
- How to record data (times and scores) in an organized way

"Computing Race" 3

Teaching Activity

- Demonstrate on the board the steps in doing the math problems (+, -, x, ÷) selected for review; class can guide you as you work the problems.
- Record the time it takes you to work a problem or 3 problems on the board.
- Demonstrate how you would work the same problems on the calculator chart.
- Record the time it takes you to work a problem or 3 problems on the calculator.
- Compare the board and calculator times (subtract) to see how much faster the calculator is (use seconds - and minutes if necessary). Explain that the ENIAC computer did 5,000 additions in one second and the CRAY-1 super computer does 80,000,000 in one second.

Guided Practice

- Have students do paper/pencil review problems (5?) and correct them. Review steps on board if necessary. Collect classes' total number correct.
- Have students do review problems (5?) on calculator and correct them. Review steps in using calculator if necessary. Collect classes' total number correct.
- Discuss errors (people vs. machines - how they're made with each).
- Have students time themselves on paper/pencil problems (5?) and the number of errors. Record the information on a simple chart. Then do 5 more problems with calculators and record time and errors.
- Discuss the findings--times and errors--making a generalization.

Independent Activity

- Group students and distribute 2 or 3 review activities.
- Each group makes a chart to collect times and errors.
- Group members take turns recording, timing, calculating and working by hand.
- Groups do activities and record information (time/errors) on charts.
- Finished charts hung on walls or bulletin boards.
- Discuss the advantages and disadvantages of using calculators.

Extension Suggestions

- Debate (pro and con) about why students should or should not use calculators to do homework.

- Use calculators to solve word problems given orally by teacher. Pairs of students work together and then explain the numbers they "entered" into the calculator and the functions they performed with them in steps.

- With older students, discuss the ramifications/ impact on our lives of being able to compute faster. What do we do with the time saved? Is faster <u>always</u> better?

Groups present the chart information to the rest of the class.
Discussion of generalizations:

- average student time vs. calculator time
- average student error vs. calculator error

Sharing

- Observation of teamwork and cooperation
- Comparison of wall charts

Evaluation

Computer Awareness Activity

Curriculum Areas

Language Arts
- Listening/speaking
- Note-taking
- Paragraph writing

Careers
Social Studies
- Research

Objectives

- To explore local business uses of computers
- To practice interviewing and note-taking
- To collect information from many sources
- To write a summary paragraph on findings

How This Activity Relates To Computer Literacy

Many companies use computers to help them store information about their products and bills. People use them at their jobs to do many functions. There are many careers opening up now which require the use of a computer and specific kinds of training. Students need to be informed about job applications of computers as possible career choices.

Teacher Options

- Limiting scope of investigation to neighborhood or to a telephone canvas or to a written letter of inquiry search for computer use information

- Length of time to complete interviews, wall chart and paragraph

Materials

- Local telephone books
- Sample P.G.&E. bill in appendix
- Interview sheet to record information
- Movie F2-1718 "Computers in Our Lives." (Optional)

Time

For teaching demonstration: 1 hour

For student activity: 3 hours

Time span suggested for this activity: 5 days

Teacher Preparation

- Decide on how information will be collected - guest speaker interviews, informal canvas, or telephone survey - approximately to your students' ability and skill.
- Design interview collection sheet (name, business, uses of computer, training, etc.)
- Contact speakers/businesses for assistance or cooperation - banks and grocery stores, insurance agencies, realtors, travel agencies, dental offices and newspapers. All tend to use computers in some way. Allow ample time to find the ones that do and will help out. Prepare a list for students.
- Create large wall chart to record results of student interviews.
- Make large calculator key pad on butcher paper for demonstration purposes.

Prior Skills Needed By Students

- Listening skills
- Key word note-taking
- Basic interview skills and/or telephone etiquette
- Write a short paragraph

Who Uses Computers 4

Teaching Activity

- Distribute gas/electric bill and discuss how the computer stores information for billing and mailing - (show movie - optional).
- Have students ask parents, relatives and neighbors about computers in their jobs - how they use them - report to class the next day and discuss.
- Invite someone who uses computers to class to talk about how they use them in their job while you interview them and students take key word notes.
- Add information to the word chart.
- List other businesses that are willing to answer students' questions and assign students to them for contact.

Guided Practice

- Distribute interview sheets.
- Practice introducing each other and etiquette in asking questions.
- Under teacher supervision, students write letter or contact person by phone. When information is in, students add information to large wall chart.
- When almost all information of first interviews is in, discuss with the class certain kinds of patterns or trends that are emerging (i.e., small businesses tend to use small computers to keep records but not to mail bills).

Independent Activity

- Students choose another business to contact by phone or mail per your list of willing participants.
- Information is added to the chart. Discuss patterns emerging.
- Students write a one-paragraph description of who uses computers and for what purposes based on the wall chart information.
- Students can write thank you notes to business people involved.

Extension Suggestions

- Students use a community map on the wall to identify the locations of businesses using computers - color coded pins by type of business.

- It may be possible to arrange field trips to banks or small businesses during non-peak hours for small groups of students. A walking field trip to several businesses in the same area may be possible with adequate supervision.

- Students can collect information from the job section of the want ads to find out job opportunities available using computers, salaries, requirements and types of businesses involved. They could present their findings in a written summary or short oral presentation.

Sharing

- Paragraphs can be posted or read aloud.

Evaluation

- Completion of interview sheets and paragraph

Computer Awareness Activity

Curriculum Areas

Art
- Design
- Graphing

Objectives

- To have students experience the uniqueness of computer graphics

How This Activity Relates To Computer Literacy

Computers can reproduce and generate graphics. Computer art has distinctive qualities because it is made by combining the squares of the grid covering the screen using limited colors. This is called "low resolution graphics." Students can learn to program graphics easily. Understanding how the computer translates a picture by using squares on a grid can be appreciated by trying to reproduce a picture themselves onto graph paper to simulate low resolution graphics.

Teacher Options

- Have students create original computer art on the graph paper with limited (6) colors, then let them combine the colors to make a second drawing.
- Have students create an original drawing on blank paper using any colors. Then have them translate it to the 40 x 48 square grid using limited colors.

Materials

- Graph paper, 1/8" to 1/4" squares
- Crayons, colored pencils or markers
- Overhead transparency/projector (Optional)
- Pictures of graphs

Time

For teaching demonstration: 30 min.

For student activity: 1 hr., 20 min

Time span suggested for this activity: 2 days

Teacher Preparation

- Use graph paper or prepare a ditto so that a computer screen is represented, 40 squares (top) by 48 squares (sides).
- Duplicate ample copies (2 or 3) for each student.
- Prepare a picture and a computerized copy of it as an example on paper.
- Prepare a grid sheet pattern on an overhead transparency or on blackboard for demonstration purposes.

Prior Skills Needed By Students

- Fine motor skills to color within graph squares

Computer Graphics 5

Teaching Activity

- Using the overhead or blackboard grid (40 x 48) explain that the computer "draws" with squares (not lines!) called "pixels" or picture elements and limited colors. Show your examples - even a simple flower - and the uniqueness will be apparent, expecially when trying to show circles.
- Draw on the blackboard a simple landscape - sun, mountains, trees, lakes... then draw it on the computer grid so students see how to "translate" lines and areas to "pixels." (Colored chalk or start with black and white.)

Guided Practice

- Distribute both blank and graph paper plus crayons or pencils. Have students draw on the blank paper - flower, sun, pumpkin, cat, etc.; then have them try drawing them on the graph paper.
- Show successful papers as you circulate to assist them.
- Try putting any difficult ideas on the board grid to illustrate ways to adapt the designs to pixels with students giving suggestions on how to modify them in several ways.
- Display the sets of drawings, blank and grid together.

Independent Activity

- Students draw on blank paper a more complex design and translate it to the 40 x 48 graph screen using the limited color scheme.
- Some students may want to try design on pixel paper. (See appendix.)

Extension Suggestions

- High resolution graphics use a 280 square x 192 square grid. Interested students may want to translate their drawings onto 1/16" grid paper and show the effect of this type of computer graphics.
- Cross-stitch embroidery designs
- Needlepoint designs (mesh) are actually "pixel" designs too. Students can both design and then execute with mesh and yarn or embroidery thread.

Sharing

- Display student work.

Evaluation

- Student ability to complete designs
- Following directions

Computer Awareness Activity

Curriculum Areas

Social Studies
- Polls/Surveys
- Data Gathering
- Graphing

Math
- Graphs

Objectives

- To investigate computerized games
- To learn how to conduct a simple poll
- To gather and summarize data
- To create a graph to display findings
- To learn why polls are important and how results are used by manufacturers, voters, etc.

How This Activity Relates To Computer Literacy

Computers have become a popular way to play games both at home and in local arcades. Different games are popular with different groups of students and change from month to month. Some people say computer games are good, others say they are bad, but their popularity continues to grow. It's helpful to be informed about trends in computer games as it is one of the most familiar applications of the computer.

Teacher Options

- Have students create original computer art on graph paper, first using limited primary colors, then blending colors to make a second drawing.
- Choice of population for polling - within class, grade level, school, or expand to home, neighborhood, etc.
- Individual or small group activity
- Type of graph used (bar, circle, line or picture)

Materials

- Questionnaires, tally sheets for students
- Sample graphs
- Sample polls
- Paper for graphs

Time

For teaching demonstration: 1 hour

For student activity: 2 hours

Time span suggested for this activity: 3 days

Teacher Preparation

- Define type of information to be gathered and recorded - questionnaire, tally sheet, sample audience.
- Create a sample poll - question to be answered, questionnaire and tally sheet, defined population, completed tally sheet, one or two generalizations made from tally sheet, completed graph showing results.

Prior Skills Needed By Students

- How to take a poll or sample (gather and record data).
- How to make generalizations
- How to create a graph - picture, bar, line or circle

Graphing Computer Game Popularity 6

Teaching Activity

- Discuss polls and their importance in making predictions - how they can influence populations/decisions.
- Show sample poll - and all the steps from the original question through the graph and how/to whom the information would be important.
- Ask questions and count by show of hands the responses to questions about favorite t.v. shows, books, foods, etc., and then graph the results on board or chart paper.

Guided Practice

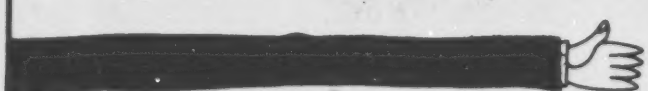
- Divide class into small groups and have them develop a question to be answered about pets, number of brothers/sisters, etc.
- Let groups decide how to ask specific questions and record answers.
- Circulate to groups and suggest ways to do it.
- Small groups share their questions and methods with whole class.
- Give time to redesign their methods if needed.
- Let each group conduct their survey (show of hands) and record results.
- Give time to graph results and share with whole class.

Independent Activity

- Students share favorite computer games' names and list on board. (Limit 2-5 minutes!) (PAC MAN, Donkey Kong, etc.)
- Individually or in pairs, students design their methods and get teacher approval.
- Students conduct survey, graph results and present to class.
- Discuss problems of "limited samples" in making generalizations or predictions.

Extension Suggestions

- Depending on familiarity with computer games, students could now conduct surveys to determine:
  - High scores on a sample of games
  - Frequency/popularity of home video systems and why
  - Opinion on good points/bad points of arcade centers
- Students could begin to think about designing their own computer game - object, graphics, scoring, etc., and test the popularity of the idea.



Sharing

- Final results of poll
- Post graphs and written generalizations.

Evaluation

- Accuracy in completing steps in taking a poll

Computer Awareness Activity

Curriculum Areas

Language Arts
- Reading Comprehension
- Vocabulary Skills
- Science Fiction
- Creative Writing

Objectives

- To introduce a science fiction story regarding computer education in the 21st century
- To reexamine positive outcomes of 20th century education
- To practice writing a science fiction short story

How This Activity Relates To Computer Literacy

Many science fiction authors use machines and computers of the future as topics for their stories. In most cases, these machines have unusual powers and abilities beyond those that we have today. Machines can help us in our daily lives, but there is a fear that in the future they will "take over." It's good to understand how computers can help us now and to think about how they might help us in other ways in the future.

Teacher Options

- If ample copies of books, older students can read story independently instead of teacher reading aloud.
- Alternate vocabulary or questions
- Story outline ideas for modeling the process to class
- Student writing topics

Materials

"The Fun They Had," a story appearing in the following reading texts:
- Economy Co. - Cinnamon Peaks
- Ginn 720 - Mountains Are for Climbing
- Houghton-Mifflin - Images

Suggested vocabulary and sample questions in appendix.

Time

For teaching demonstration: 1½ hrs.

For student activity: 2 hours

Time span suggested for this activity: 4 days

Teacher Preparation

(Locate Cinnamon Peaks or other story source.)

- Preview the story and the discussion questions.
- Introduce vocabulary if necessary.
- Sketch rough ideas/outline for your own science fiction story for the teaching activity.
- Locate other science fiction short stories for follow up lessons
- Organize discussion for teaching activity.
- Write vocabulary and questions on the board. (See appendix.)

Prior Skills Needed By Students

- Definition of "science fiction"
- How to write a short story
- Awareness of time in centuries (now 20th century; 2000 = 21st century)
- Literature appreciation skills
- Listening skills

Computers in Our Future 7

Teaching Activity

- Discuss with students science fiction books or movies they have read or seen.
- List the qualities that make them "science fiction" - not true about the future, science or inventions, etc.
- Based on what they know from previous activities, help students think about and discuss how computers might be used in science fiction stories.
- Introduce "The Fun They Had" - vocabulary and preview questions. (You may want to divide questions among small student groups for listening skills.)
- Read the story aloud and discuss how education is different in the story from how it is today. Have them list good and bad points of learning each way.
- You may want to read it to them again and have them discuss vocabulary and preview questions.

Guided Practice

- Discuss what qualities of the story make it "science fiction" and list them.
- Explain, as you model, how you would map or outline your own story to include those qualities. Discuss detail, plot and climax with older students.
- Write a rough outline of the story, with students suggesting details, onto the board or overhead projector, stopping about 2/3 of the way.
- In small groups have students finish the story ending.

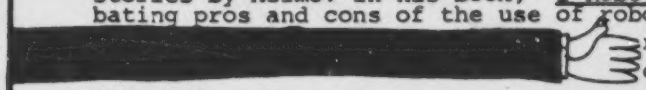
Have groups read their endings to the rest of the class while you check for understanding. Classmates can give additional ideas to each group about details which could be added or changed to make it more like science fiction. Discuss.

Independent Activity

- Students write a story similar to the science fiction story modeled after brainstorming some possible topics on the board or
- Students could use "The Fun They Had" ideas and write a story about living in the future or about a computer used for education in the future.
- Students read stories aloud, stopping 2/3 of the way to see if classmates can predict ending based on evidence given. (Review plot/climax.)

Extension Suggestions

- See bibliography for other computer-related materials available.
- "Publish" stories and essays to send home to parents. If a parent has a word processor and printer, that's an even better medium to use.
- Have students look in the school or public library for other Asimov books and share the list they make with classmates.
- Students draw pictures of computerized houses, specifically their bedrooms and kitchens, by labelling devices, gadgets, etc., and discuss improvements.
- Some students may want to report on Issac Asimov to see how an author "looks" into the future or gets ideas for his book.
- This may lead into a discussion on computer-assisted instruction - pros and cons from news articles.
- Other stories from Images (Houghton-Mifflin) which lend themselves to similar study include "The Computer Triumphs Again" and "Computers - Giant Brains?"
- Older students could read and discuss the short stories by Asimov in his book, "I Robot," debating pros and cons of the use of robots, the resulting change in lifestyle, etc.



Sharing

- Students read stories aloud or post them.

Evaluation

- Teacher evaluation of stories

Computer Awareness Activity

Curriculum Areas

Math
- Basic math facts
- (+, -, x, ÷)
- Basic math operations

Language Arts
- Listening skills

Objectives

- To learn and demonstrate the four functions of a computer
- To review basic math facts and operations

How This Activity Relates To Computer Literacy

All computers, big or small, perform the same four operations. They accept information, store the information, process it and give it out. People do the same jobs as computers every day. By analyzing jobs we do that are like the computer, students begin to understand the concept of information management and the powerful advantages of using a computer.

Teacher Options

- Selection of examples of tasks we do which are like the computer's operation
- Choice of math facts (1 - 100?) and operation (+, -, x, ÷) for drill or do story problems with more complex operations as students progress

Materials

- Tagboard (2 sheets per student)
- Crayons or markers
- Scissors
- Rubber bands or envelopes to hold completed cards
- Large drawing of a computer (See appendix.)

Time

For teaching demonstration: 30 min.

For student activity: 40 minutes

CARDS USED ALL YEAR!

Teacher Preparation

- Gather supplies.
- List 4 computer operations on blackboard.
- Think of several more examples of jobs we all do that are like the computer. (See appendix.) Choose 2 examples to teach and 2 for guided practice.
- Ditto numbers onto tagboard and cut. (See appendix.)
- Put sets in envelopes or rubber bands around them.
- Find a large photo of a computer or draw one.

Prior Skills Needed By Students

- Basic math facts and operations to be given orally by teacher

How a Computer Works 8

Teaching Activity

- Review with students about using a calculator (Act. #2). You put in the problem, it searches for the information and gives out the information on a lighted screen. Introduce the 4 computer operations and compare them to examples of things we do like the computer process. (See appendix.)
- Show them a picture or drawing of a computer - the keyboard for putting in information, the memory (inside) for storing it, the processing unit (inside) which sorts rapidly through it, and the screen t.v. which gives the information so we can see. Compare it to how we manage information. (See appendix.)

Guided Practice

- Have students work through some examples of things we do which are like the computer functions.
- Explain that you are going to have each student make "output" cards so that they can give answers like a computer screen.
- Distribute sets of dittoed cards and crayons or markers - colors which can be seen by you from across the room. When done, students arrange their output cards on the desk or table in front of them 0 to 20.
- Give problems per appendix instructions.

Independent Activity

- Output cards can be used in a variety of ways - with you or students giving problems orally. Vary and mix operations as students response time quickens. Introduce word problems. For more complex problems allow students to use paper and pencil.
- Try giving the problem numbers and the answer. They then use 4 special cards (+, -, x, ÷) to indicate the operation you used.

Extension Suggestions

- Add to the set of output cards: parts of speech, punctuation marks, etc.

- Special sets can be developed for science or social studies vocabulary. (You give definitions, they hold up the word.)

  Note: "Output" cards are a good activity throughout the year. They are especially good in spontaneous situations when there are 5 - 10 minutes of unexpected time available - before lunch or recess, etc.

- Discuss things we do beyond what a computer can do - feel, think, create.

- Explore robots and what they are used for. (See books in bibliography.)

Sharing

- Students can work in pairs to think of examples and color "output" cards.

Evaluation

- Students can be asked to name the 4 computer operations and give an example.
- Answers to oral math problems are checked on the spot as students hold up their "output" cards.

Computer Awareness Activity

Curriculum Areas

Social Studies
- Data gathering

Language Arts
- Record keeping

Objectives

- To have students investigate homes for evidence of computers
- To cooperate in a group task situation
- To keep accurate records and supply needed information

How This Activity Relates To Computer Literacy

Computers are used by many businesses to keep count of their products and to send bills to their customers. They touch the everyday lives of many people who are sometimes unaware of how computerized their world is becoming. Students need to be aware of ways the computer contributes to our daily activities.

Teacher Options

- Time limit of the scavenger hunt
- Grouping of students
- Design of scoring procedure and prize
- Providing an initial list of evidence as a check-off sheet for younger students instead of requiring them to search and then generate their own list

Materials

- Brown shopping bags or boxes to store "found" items
- Large butcher paper wall chart to keep score and inventory list
- An inventory work sheet for each group of students and "evidence slips" for each (See appendix.)

Time

For teaching demonstration: 30 min.

For student activity: 2 hours

Time span suggested for this activity: 5 days

Teacher Preparation

- Go through your own home identifying common ways computers touch your life - bills, mailing labels, product control marks, some microwave oven controls, etc. Bring 2 or 3 examples. (See appendix.)
- Decide on prize.
- Prepare wall chart for team inventories and the inventory work sheet.
- Decide how to score found items to allow for items too large to bring to class (microwave oven control, automobile gas mileage control, etc.); perhaps "evidence slips" which require a drawing and description with parent signature.
- Make a list of items - some computer-related and some not - for the guided practice exercise.

Prior Skills Needed By Students

- Have an understanding of how a scavenger hunt works.

Computers in My Neighborhood 9

Teaching Activity

- Define a computer as a machine that can accept, store, process and give out information. Sometimes it is built into something and you can't recognize it. Discuss some of the items listed in the appendix. Discuss why some things are computers and some things are not a computer. (an electric can opener, stapler, etc.).
- Ask students who have been on scavenger hunts to share with the class how they work. If none have been on one, describe one for them.
- Show the bag of things you brought from home (include one or two completed "evidence slips") and explain how they relate to computers and how to look for evidence. Show them an inventory sheet with those items filled in correctly.

Guided Practice

- Have students respond thumbs up (yes), down, (no), sideways, (don't know) to a list of potential computers. Discuss each one - why it is or is not a computer or computer related.
- Divide students into groups and pass out inventory sheet and "evidence slips."
- Discuss the wall chart, the scoring process, and any prize attached for the high scoring team.
- The next day have teams report on their findings, fill in the wall chart, and give points for valid items. Reteach the process for those teams still unclear.

Independent Activity

- Students daily report in teams with their findings, add to the wall list, get points, and keep their team inventory list up-to-date. Items brought from home are returned the same day, but an evidence slip must be left in the bag in its place.
- Prize awarded to winning group or to whole class as predetermined.

Extension Suggestions

- The activity could be extended for a longer period of time or repeated at a later date.
- The hunt could be expanded beyond the neighborhood as students' understanding increases.
- After a very advanced discussion, older students could classify computer usage for each item as either:
  1) information retrieval (finding needed information that has been stored)
  2) data processing (Taking data and doing something with it.)
  3) process control (regulates certain situations like temperature)
  4) simulation (imitating real-life situations)

- Daily team reporting
- Whole class determination of "evidence slips" as computer related or not

Sharing

- Daily scoring of items

Evaluation

Computer Awareness Activity

Curriculum Areas

Language Arts
- Vocabulary development
- Dictionary entries
- Alphabetizing

Objectives

- To familiarize students with general computer terminology
- To compile a limited computer dictionary

How This Activity Relates To Computer Literacy

Computers have special words to describe them and what they do. Many of these words are new and very strange to us. Knowing what they mean can help us better understand computers. Since most of these words are not found in a regular dictionary, a special list is helpful.

Teacher Options

- This activity can be used now in this sequence or used later as a summary or review activity.
- Size of dictionary and length of time to extend lesson
- Amount of detail in entry format
- Adding illustrations or pictures to the terms and using them as flashcards
- Choice of vocabulary words from the dictionary in appendix as appropriate to class ability and interest

Materials

- Paper for dictionary pages and construction paper for covers
- Dictionary terms (See appendix.)
- Dictionaries (Regular classroom plus one from the resource list designated as a computer dictionary for children, if available

Time

For teaching demonstration: 1 hr.

For student activity: 40 min.

Time span suggested for this activity: 10 days

Teacher Preparation

- Cutting paper and cover to desired size and stapling booklets together
- Choose a limited number of computer terms (10) for the first lesson and prepare examples and illustrations on chart paper. Modify the language in the definitions as appropriate. They already know "bug" from Activity #1 and "pixel" from Activity #5.
- There are computer dictionaries listed in the bibliography in the appendix to use as resources.

Note: Building a picture file in advance helps in having visual examples of some of the vocabulary.

- Determine the format and needed information required for each dictionary entry.

Prior Skills Needed By Students

- Alphabetize to the third letter
- Understand and use a dictionary to find definitions

Computer Dictionary 10

Teaching Activity

- Review dictionary purpose and use - look up the definitions to some non-computer-related words and use them in sentences.
- Present 3 words chosen from the appendix list and give explanations and illustrations. Write definitions on the board for students to copy in their dictionaries per the format you give them.
- Present 2 other words with explanations and illustrations. Elicit student-phrased definitions. If necessary, have a panel of judges select the best definition or put it to a class vote - criteria being clarity and completeness.
- Review the format and needed information for each word - respelling, part of speech, definition, etc.

Guided Practice

- Students work in pairs or threes as you give five additional terms with their explanation and illustrations. They draft definitions and some share with the rest of the class as you circulate and choose good examples.

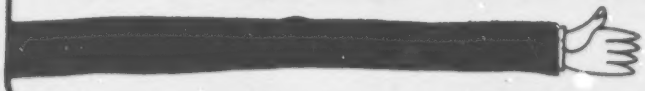
- Completed dictionaries (10 entries) are exchanged among pairs and suggestions incorporated to improve definitions. Together, partners write sentences for their words which best describe how you would use the word.

Independent Activity

- Additional terms and explanations are given over a period of time. Students work in pairs to develop good written definitions and make additions to their dictionaries.

Extension Suggestions

- Students make flashcards or picture cards to practice words.
- Students find additional computer terms and definitions beyond the appendix list to add to their dictionaries.



- Proofreading other students' definitions and writing sentences in pairs

Sharing

- Completed dictionaries for quality of entries
- Quiz on terms

Evaluation

Computer Awareness Activity

Curriculum Areas

Language Arts
- Letter writing

Social Studies
- Gathering data

Objectives

- To review parts of a letter
- To write a letter of inquiry
- To learn about activities and costs of computer camps as sources of learning about computers

How This Activity Relates To Computer Literacy

Many people, especially kids, want to know about computers and how to use them. One of the ways to learn about them is to go to a computer camp. In learning about camps - locations, activities, costs - students become aware of another source of information about computers.

Teacher Options

- Choice of ads - number, types - and distribution to students
- Content for letter which is modeled for students
- Many extension activities

Materials

- Camp ads
  (See appendix.)
- Paper and pencils
- Butcher paper for wall chart and markers
- U.S. or California maps
  (Optional)

Time

For teaching demonstration: 1 hr.

For student activity: 2 hours

Time span suggested for this activity: 4 days over a period of three weeks

Teacher Preparation

- Cut out additional ads for camps from magazines and newspapers to get a wide variety of sources (10 plus).
- Mail away for information from 1 or 2 camps so students can see what they might get back for their inquiry efforts.
- Make model of parts of a letter and list things to include in a letter of inquiry.
- Make model of how to address an envelope.
- Make wall chart - columns for information to be collected.
  (See appendix.)

Prior Skills Needed By Students

- How to write a simple letter

Computer Camps 11

Teaching Activity

- Discuss camps - share experiences at Boy/Girl Scout, Campfire camps and what's learned.
- Share with them the letter you wrote and information you got back - the types of things you could learn, etc.
- List the types of things you would want to know about if you were choosing a camp to attend.
- Fill in the first row of the wall chart with your information as you think out loud to students and translate information into your own words as you write. Some columns may be blank. If important, discuss <u>why</u> information might have been omitted - costs, dates, locations, etc.

Guided Practice

- In order to compare camps to make a choice, more data is needed.
- Review the parts of a letter as you model how to write a letter of inquiry on the board for the class - plan, draft, edit and rewrite. Address an envelope (on the board) for students to use as a model.
- Students can copy this as a handwriting exercise.
- You can have them label the parts of the letter they copied from the board - greeting, body, closing, etc.

Independent Activity

- Have students choose an ad or distribute randomly.
- Students can work in pairs to write the letters which they mail.
- As letters arrive back, students (or you) can enter their information on the wall chart - colored pins on a U.S. or California map mark locations.
- Discuss or investigate new terms (LOGO, PILOT, etc.) as they are added to the wall chart. Add to their Activity #10 dictionaries, too.
- When all information is on the chart, help students see patterns - similarities and differences - and make appropriate inferences about data.

Extension Suggestions

- Explore local computer classes or camps and scholarship possibilities from civic organizations.
- Students may wish to do some creative writing - imaginary diary from someone at computer camp or winning a contest to go to a computer camp.
- Students can defend in a paragraph or speech why they would go to one camp rather than the others.
- Design posters advertising a camp - real or imaginary. Use advertising techniques in appendix designed for Activity #15.
- Students may wish to gather information on other kinds of camps (Dieting, Western, Sports, etc.) and compare information to computer camps - costs, activities, locations.

Sharing

- Discuss (+'s and -'s) different camps and which ones students would choose and why.

Evaluation

- Skim letter and envelope for necessary information, clarity and neatness.

Computer Awareness Activity

Curriculum Areas

Math
- Plotting coordinates

Art
- Graphic design

Language Arts
- Writing and following directions

Objectives

- To practice plotting coordinates on a grid
- To write clear plotting programs
- To graph color and black and white designs by following a plotting program

How This Activity Relates To Computer Literacy

Computers give us information on the screen as a result of programming done by a human. Computer errors occur as a result of incomplete or wrong programming instructions. Programmers must be very careful in writing instructions for the computer. Writing plotting instructions to create graphics gives students a beginning experience in writing simple programs and in understanding the process and skills necessary for programming.

Teacher Options

- For younger students you may want to use letters for the rows and numbers for the columns to reduce confusion.
- You may want to use only black and white designs and leave out the color designs if time is limited.
- Use of overhead projector and transparencies to teach coordinates is optional. Non permanent markers allow you to reuse the master grid for several designs.

Materials

- Dittoed graph paper with numbers indicated (See appendix.) 2 or 3 sheets per student
- 2 or 3 completed PLOT programs with samples
- Some blank PLOT programming sheets - 2 or 3 per student
- Colored pencils or markers - crayons OK if using large grids
- Overhead projector (Optional)

Time

For teaching demonstration: 30 min.

For student activity: 2 hours

Time span suggested for this activity: 4 days

Teacher Preparation

- Make dittoed graph paper or get pixel paper.
- Make 2 or 3 finished PLOT, graphic designs and write down the coordinates. (Use black and white only on the first ones.) Fill in the PLOT programming sheets and duplicate or put on overhead transparency. (See appendix.)
- Make 2 or 3 graphic designs using color, and make the PLOT programs which use color directions. Duplicate or put on overhead transparency.

Prior Skills Needed By Students

- Playing the grid game "BATTLESHIP " is a good readiness activity.
- How to find coordinates on a grid using columns and rows.
- Review horizontal and vertical (across/down).

Computer Plotting 12

Teaching Activity

- Recall with students how to work crossword puzzles and/or how to play BATTLESHIP paying special attention to using "across/down" and "letter/number" as locations for something to happen. Discuss what happens when you "miss" the location You get confused or messed up - you can't finish and you lose the game.
- Explain that the computer displays pictures and words on its screen using grid locations to fill in squares and make a pattern. (Recall Activity #5.)
- Pass out graph paper with numbers while you use one on the board or on the overhead projector.
- Discuss "across" and "down" coordinates by using numbers separated by a comma and enclosed in parenthesis. (See appendix.)
- Have students practice locating coordinates on the board grid by coming to the board and pointing to locations as you call them out.

Guided Practice

- Call out coordinates for a chosen design and have students darken the squares on their sheets. (Circulate to check understanding.) Have students fill in squares on the board or transparency also until design is finished as a model.
- Give them a plot programming sheet with a design plotted. Have them work in pairs to complete onto graph paper. Then give them a blank programming sheet and a completed graph design and see if they can fill in the program.
- Pass out colored pencils/markers, more graph paper, and a completed plot programming sheet using color. Students work in twos or threes to complete the design.

Independent Activity

- Students make black and white or color designs and complete the programming sheet. Program and design are cut (see appendix) so that students can exchange programs and plot the other's design.
- Programming errors will be very obvious in the designs.
- Discuss ways to avoid programming errors. (Have a system...)

Extension Suggestions

- Call out coordinates like a BATTLESHIP game. The one who guesses first what the design is will be the one who makes a program for the next day.
- Use tiny graph paper or pixel paper for more complex designs and plotting programs.
- Have students write words or messages using plotting programs.
- Have them use vertical line (VLIN) and horizontal line (HLIN) commands to eliminate some coordinate plots - This makes plotting faster and easier. (See appendix.)
- Code colors with a number instead of writing out the word to make it more like a computer program. (See appendix.)

Sharing

- Students exchange programs and plot each other's designs.

Evaluation

- Give students a program and have them plot it. Errors are obvious.

Computer Awareness Activity

Curriculum Areas

Language Arts
- Vocabulary - acronyms
- Dictionary skills

Objectives

- To learn that computers speak different languages
- To know the names and uses of some of these languages
- To learn about acronyms and what they stand for

How This Activity Relates To Computer Literacy

Just like people from different countries (Spain, France, Egypt, etc.) who speak different languages, computers speak different languages, too. Some computer language is easy to learn (BASIC) and others are more complex (PASCAL). By becoming aware of some of the computer languages, students can begin to see the different uses of computers and the languages necessary to communicate with them.

Teacher Options

- Choice of acronym worksheets in appendix
- Part or all of lesson as a guided practice
- Choice of which and/or how many acronyms to use in the lesson
- Use of tagboard signs for some or all computer language names listed in the dictionary

Materials

- List of computer languages (Appendix)
- Worksheets and dictionaries (Optional)
- Chalk and chalkboard
- Tagboard
- Markers
- Dictionaries

Time

For teaching demonstration: 20 min.

For student activity: 1 hour

Time span suggested for this activity: 2 days

Teacher Preparation

- Review explanation of an acronym and some examples
- Print (all capitals) names of 5 of the 7 computer languages which are acronyms (appendix) on tagboard. Place on bulletin board for display.
- Write full titles on chalkboard.
- Duplicate worksheets (appendix) or make your own compatible with classroom dictionaries.
- Generate examples of different kinds of acronyms and abbreviations so students can practice distinguishing between them as part of the guided practice activity.

Prior Skills Needed By Students

- Dictionary skills

Computer Languages 13

Teaching Activity

- Discuss situations where a foreign language is helpful. List some foreign languages and see if students know some words and their meanings. Discuss sign language and its use in communicating with the deaf.
- Tell students that computers understand several languages. Introduce names of the computer languages and go over the full titles and the uses.
- Explain that 5 of them are acronyms - words made up from initial letters of other words. Have students pick out the letters that make up the computer language acronym. Discuss the difference between acronyms and abbreviations. Try examples of each to avoid confusion later.

Guided Practice

- List selected acronyms. Use dictionaries to locate meanings and the words from which they were derived.
- Discuss why people use acronyms (faster, easier to say).
- Have students work in pairs on several more acronyms - locating definition and the words from which they were derived.
- You may wish to work through one of the worksheets (Dictionary Search) as a class.

Independent Activity

- The second worksheet (Acronym Challenge) gives the definitions of the SAME acronyms from the first worksheet. Use as a reinforcer after first worksheet has been completed.
- List the 26 acronyms on board and have students do "Word Search." The list, search and answer keys are in appendix.
- Students may want to find other new acronyms and their meanings.
- Have students group the acronyms into similar groups and label them. Discuss why so many have to do with science and organizations if there is a pattern in these areas.

Extension Suggestions

- Students may want to create acronyms for words of their own choosing and start a class list of new acronyms.
- Group reports on some of the acronym topics (laser, ENIAC, radar, UNIVAC..) to share with the class
- Individual research/report on a computer language - its origination, uses, terminology
- Bring in computer printouts of programs written in different computer languages.
- Computer programmer as a guest speaker on career-training, duties, etc.

Sharing

- Share new or invented acronyms.
- Share reports on acronym topics.

Evaluation

- Completion of chosen worksheets
- Quiz on names of computer languages and uses if discussed and studied

Computer Awareness Activity

Curriculum Areas

Social Studies

- Research/data collection
- Concept of change and cause/effect
- Using graphs, tables and charts

Language Arts/Library

- Using reference materials
- Writing a paragraph

Objectives

To learn the more recent developments in computer history

To research other events and conditions surrounding computer developments

To make inferences from collected data

How This Activity Relates To Computer Literacy

The more recent generation of computers has evolved rapidly as a result of other events and conditions in history. Looking at history helps us to understand what changes (or progress) have occured over a period of time. Computers in the 1880s were different from today's - life in the 1880s was different, too. Computers are changing how we live our daily lives and shaping our future now.

Teacher Options

- Time span/events to be covered in research
- Topics for columns on data collection chart other than ones in appendix
- Length of time for research
- Students to work in research "teams" of 2 or 3 - or as individuals
- Type of reference books to be used by students

Materials

- Encyclopedias and/or almanacs
- Large wall chart for data storage
- Small data charts for students
- "Computer History" copies from appendix (1 per student or research team) perhaps saved from Activity #2

Time

For teaching demonstration: 2 hrs.

For student activity: 2 hours

Time span suggested for this activity: 5 days

Teacher Preparation

- Gather reference books or reserve time in the library
- Choose computer dates (1, 2, 3, or 4.) for the chart rows and categories for the chart columns (see appendix). Make sure these topics are in the reference books available.
- Make wall chart and ditto small charts for each student - filling in some of the information to use as examples when teaching.
- Duplicate copies of "Computer History" or use ones saved from Activity #2.
- Think of cause/effect events (social studies, lessons appropriate for your students to use as examples in the teaching activity).

Prior Skills Needed By Students

- How to locate needed information in chosen reference books
- Writing a paragraph

Computer History, 1890-Now 14

Teaching Activity

- Read and discuss second page of "Computer History."
- Review why calculators and computers were invented.
- Point out that microcomputers evolved because of other events and conditions in history. NASA needed smaller computers for space (Race for space with Russians) and financed some of the research.
- Discuss other cause/event situations in history which you've studied as a class.
- Review Act. #4, "Who Uses Computers," and #9, "Computers in My Neighborhood." List the ways our lives would be different today without computers (i.e., we have less time to do other things). Assist students in defining "change," "progress," and "cause and effect." Take an historic event (Revolutionary War, World War I) and review events leading up to it as a sequence of cause and effect relationships.

Guided Practice

- Describe the detective work to be done to discover other cause/effect events leading up to the development of microcomputers.
- To get a better picture of events and conditions around the major computer developments, students will research chosen dates and topics from reference materials. Divide them into teams of 2 or 3.
- Distribute books to students and review how to locate information.
- Explain chart and model how you located the information you've already filled in.
- As a class, practice looking up information for several squares. Then have students look up information for different squares and report for whole class while you record on chart.

Independent Activity

- Have students work in teams to complete the rest of the chart or, if time is short, divide sections of the chart among the teams. The teams complete their information gathering and add to the wall chart.
- Discuss as a class the data on the chart - what life was like as each computer development occurred. Look for cause/effect relationships, if any. Students write a summary paragraph from the chart about a column or row of their choice. If there is cause/effect data with each computer development this topic is also an option. Model the writing process if necessary.

Extension Suggestions

*Point out to students that they are modeling the computer functions.
1) They input data - written instead of typed.
2) They stored the data - onto wall chart instead of memory.
3) They are processing the data - thinking about it, however, instead of just sorting it.
4) They will display the data - onto a paper paragraph rather than on a screen.

1) Computer Era Museum
Students may wish to create their own museum by collecting pictures, photos, memorabilia of the era surrounding each computer development and display it in boxes with saran wrap fronts for viewing by other classmates or classes.

2) The October, 1982, issue of National Geographic magazine features "The Chip" - how it's made and how it operates. Older students may want to investigate and report to the class on the cause/effect role of the chip on microcomputer development.

- Students critique each other's paragraphs in small groups with a short list of criteria from you.

Sharing

- Teams turn in completed charts
- Paragraphs for content and structure

Evaluation

Computer Awareness Activity

Curriculum Areas

Consumer Education
- Advertising

Social Studies
- Collecting and analyzing data

Objectives

- To identify selling points in an ad
- To recognize techniques in advertising
- To identify the most popular techniques used in advertising computer hardware

How This Activity Relates To Computer Literacy

The computer hardware business is one of the most profitable and competitive markets today. Computers are complex and expensive. Many people are interested in buying computers for their homes, their offices, and their schools. Advertising (print and media) uses given techniques to get people to buy computers. To be an informed shopper, students need to understand those techniques and how to identify them.

Teacher Options

- Choice of computer ads
- Selection of how many and which advertising techniques to study
- Whether to duplicate ads or make transparencies of them for use on overhead projector
- Number of computer ads students will analyze as they tally and record techniques used in computer ads.
- Save computer ads for use in Activities #16, #17, #18.

Materials

- Magazine and newspapers for ads
- Materials from appendix
- Chalkboard and chalk
- 2 large wall charts - one for new terms/one for tallying number of techniques found by students in their ads.
- Overhead projector (Optional)

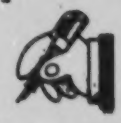
Time

For teaching demonstration: 1½ hrs.

For student activity: 3 hours

Time span suggested for this activity: 5 days

Teacher Preparation



- For the week(s) prior to this activity, have students collect 5 or more computer ads.
- You collect 3 or 4 that have examples of some of the techniques described and underline. Duplicate as work sheets.
- Duplicate appendix materials.
- Collect other ads of products popular with your students (jeans, foods, etc. and underline advertising techniques to use in the teaching activity. Duplicate or put on transparencies.
- Watch t.v. and take notes on several current commercials appealing to students and note the advertising techniques used.
- Wall charts put up to collect new terms and to use as a tally sheet

Prior Skills Needed By Students

- Some knowledge about computers from previous activities (vocabulary, function and uses)

Analyzing Computer Ads 15

Teaching Activity

- Discuss with students <u>their</u> favorite t.v. commercials. List several on the board. Next to each one elicit and record reasons <u>why</u> students like them.
- Discuss the object of advertising (to sell products) and some of the advertising techniques used in the t.v. commercials listed on the board.
- Distribute the list of advertising techniques to be studied. Discuss each one giving examples from t.v. commercials or printed ads.
- Distribute underlined ads of popular products. Use one to show examples of some advertising techniques. Discuss each of the popular product's ads (jeans, food, etc.) and identify techniques used.

Guided Practice

- Distribute simulated ads from appendix. For the ad at the top of the page, have them identify and label underlined advertising techniques used. On the bottom ads, have students work in pairs to underline, identify and label the techniques used. Discuss.
- Distribute copies of real computer ads you selected and underlined. Have students identify and label techniques used. Discuss to check answers.
- Discuss easiest techniques to recognize, and clues or key words to look for. Circle key words in ads used thus far.

- Distribute advertising work sheet (appendix) and students work in pairs to analyze one ad from their own collection - you circulate to help. Pairs report back to whole group on techniques found.
- Discuss how computer ads are different from other types of ads!

Independent Activity

Note: Students will discover unfamiliar jargon and terms. Have them write them on the wall chart as they find them for discussion later. (See extension suggestions.)

- Students work in pairs to find, underline, identify and label advertising techniques found in 5 (or more) computer ads. They tally on wall chart the number of times an advertising technique is found in their ads.
- Class discussion about tally patterns on wall chart - those techniques used lots, very little, and why. On the blackboard compose, with help from the class, statements/generalizations about the findings.

Extension Suggestions

- Have students list all or selected new terms from ads and the definitions in their computer dictionary started in Activity #10.
- Students may want to build booklets of ads using one predominant type of advertising technique.
- Choose another product (trucks, bikes, floor wax, jeans...) and have students analyze ads to discover predominant techniques and why.
- Students can create a computer ad - picture and message - using an advertising technique learned.
- Choose a selection of 5 current and appropriate t.v. commercials for class to watch and analyze for techniques. Discuss advantages of t.v. ads over written ads and relative costs!

Sharing

- Work done in pairs or small groups
- Reporting/tallying techniques from ads
- Class discussions of trends & reasons

Evaluation

- Collect packets of analyzed computer ads and grade.
- Quiz on techniques used.

Computer Awareness Activity

Curriculum Areas

Art
- Lettering Styles
- Use of color

Consumer Education
- Brand names/labels

Objectives

- To become familiar with computer brand names
- To discover different styles of lettering
- To learn the ways color affects people
- To choose and design a name for a computer with attention to color and lettering

How This Activity Relates To Computer Literacy

Selling computers is a highly competitive business. Manufacturers rely on the brand name as a trademark to identify their product and, hopefully, make it stand out from others so shoppers choose it instead of a competitor's product. The brand name needs to be "attention-getting" - good color and lettering - and attract customers who are interested in buying a certain kind of computer. Knowing this, students will be better informed consumers in the computer marketplace.

Teacher Options

- Selection of computer brand names for study (how many/which ones)
- Concentration on lettering or color or both
- Use of stencils as a helper for younger students in lettering
- Choice of medium for final copy of brand name - marker, pencil, paint...
- Focus on logos used by companies and the symbols involved
- Use of this name as the focus for models to be built next in Activity #17

Materials

- Rulers
- Colored pencils, markers or paint
- Scratch paper for practice
- White paper for final copy
- Copies of materials from appendix
- Graph paper/stencils for younger students

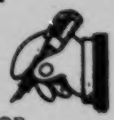
Time

For teaching demonstration: 1 hr.

For student activity: 2 hours

Time span suggested for this activity: 3 days

Teacher Preparation



- Have students begin a collection of brand names of computers from magazines or brochures - most of them in color, hopefully!
- You build a collection (or collage) on a wall chart - some computer brand names and some from any popular products students would recognize - for the teaching activity.
- Duplicate selected appendix materials.
- Design a brand name using the same lettering and color information students will have so you can model the process for them. (planning sheet)
- Gather other materials for the art portion of activity.

Prior Skills Needed By Students

- Drawing straight lines
- Block lettering experience is helpful but not necessary.

Name Your Computer 16

Teaching Activity

- Review advertising techniques from Activity #15.
- Show students wall chart with brand names of popular products.
- Have students add some to the list that immediately come to mind.
- Analyze the two brand names kids like best for a logo or symbol, colors used (if any) and type of lettering. Explain that these are used in advertisements in a very planned way to attract shoppers.
- Distribute color information and discuss. Give examples on wall chart which illustrate usage of color (usually lots of red or bright colors) and why they were chosen based on the type of product and image they wished to create. (Apple!)
- Repeat with lettering information and choose brand name examples that create a certain feeling.

Guided Practice

- Have students practice "associating" products with colors & letters & symbols: Tuna = blue or green, fish or sea logo; orange juice = orange, yellow, sun logo; Computer = _____, _____? Levis = blue, cowboys, etc...
- Analyze the lettering and colors/logo for several computer brand names.
- Discuss how colors/letters might be different for computers being sold for home use, business or schools, and why. (Audience!) Review computer uses, Act. #4! Model the process you went through in designing a brand name for your computer. (See appendix planning sheet.)

- Have students work in pairs to complete their planning sheets which they have you sign before beginning their design.

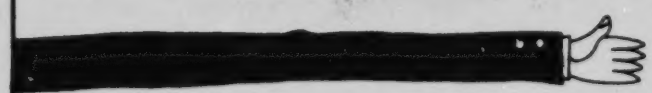
Independent Activity

*Students may need to practice lettering and spacing by working on graph paper in 1" squares.

- Have students design lettering and symbol first, then add color after.
- You approve rough draft design; then they complete it.
- When brand name is done, students write a summary of their design planning into a paragraph including a description of their computer and its uses.

Extension Suggestions

- Collect brand names for the same kinds of products - one page for Levis, one page for ice cream, one page for fast food restaurants - and analyze for color, lettering and logo. Students write statements at the bottom of each page indicating trends and possible reasons for similarities they observe.



Sharing

- Post finished designs and paragraphs on bulletin boards.
- Students can give a short explanation to the class.

Evaluation

Check completed trademark for:

1) planning sheet
2) use of color and lettering per rationale
3) Paragraph summary completeness

Computer Awareness Activity

Curriculum Areas

Art
- Constructing a model

Language Arts
- Following directions
- Vocabulary

Math
- Measurement

Objectives

- To create a model of a computer's 4 main parts
- To review the 4 basic functions of a computer

How This Activity Relates To Computer Literacy

Computers have 4 basic functions (See Activity #8). Each function is done in a key part of the computer.

a. The Keyboard - to put information (program) into the computer
b. The Memory (inside) - to store information
c. The Central Processing Unit (inside) - to sort and process the information
d. The Display Screen - to see the information that's in the computer's memory

Knowing these parts and functions helps students understand how computers manage information.

Teacher Options

- Using other materials to create the model (shoe boxes, boxes made by students out of tagboard or heavy paper)
- You may want to tie this lesson to Activity #16, "Name Your Computer," and let students construct a computer from materials of their choosing to fit the name they chose.
- Letting students work from written directions or doing it step-by-step as a whole class as you model it

Materials

See detailed materials list in the appendix.

Generally needed are:
- Dry soup boxes
- Red and green construction paper
- Paint and brushes
- Markers
- Small white cups (nut cup)
- Copies of keyboard

Time

For teaching demonstration: 1 hr.

For student activity: 2 hours

Time span suggested for this activity: 5 days

Teacher Preparation

- Several weeks in advance, have students save and bring to class some materials from list in appendix.
- Several days in advance, have students make a collage of computer hardware photos.
- Practice making a computer yourself by following directions in appendix so that you have an insight about difficulty level and have a model to show students. You may want to use several boxes and show what the model looks like after each step!
- Assemble materials and equipment.
- Duplicate keyboard and instructions if needed.
- Make a large drawing of a computer with its parts labeled.
- Consider recruiting some parent volunteers to help younger children with the project and precut materials.

Prior Skills Needed By Students

- Careful painting and gluing skills
- Measuring and drawing straight lines
- Following directions

Computer Components 17

Teaching Activity

- Review with students Activity #8 - "How Computers Work."
- Review large computer drawing and discuss the parts as students make their own drawing, labeling the parts and writing out the function of each part. Note that 2 parts you can see (display screen and keyboard) and 2 parts you can't (memory and CPU).
- Have students practice in pairs naming the parts of a computer and the function of each. You can call out a function, they point on their drawings to the correct part.
- Show them your finished computer model and demonstrate for them the steps you went through to do it. Ask students to repeat back to you the steps to go through as you follow their directions and demonstrate it a second time - reteaching parts which are unclear to them.

Guided Practice

See detailed directions in appendix for constructing the model.

Independent Activity

Students may want to modify and personalize their computer in the following ways:

1) brand name
2) keyboard design
3) putting in a green screen for their display with a cursor (▯) and message
4) graphics on exterior of computer

STUDENTS MAY ALSO USE BRAND NAME DESIGNED IN ACTIVITY #16 AS THE BASIS FOR PERSONALIZING THEIR MODEL.

Extension Suggestions

- Students may want to study peripherals which can be attached to the computer (disk drives, printers, cassette players, modems, etc.) and make models to attach to their computer model with a yarn "cord."
- Make a brochure or ad to go with their computer explaining software programs available, main applications (business, home or school) and cost. Review Activities #4, #9 and #15 for ideas.
- Students may want to create a scrapbook of different kinds of screens, keyboards, peripherals and other computer equipment with explanations of their functions, special features and costs.
- Plan and conduct a computer fair for students to display their models, ads, materials for others.

Sharing

- Students display their computers for each other, other classes or parents, and explain how they work.

(See Act. #18)

Evaluation

- Quiz on parts of a computer and their functions
- Checking models for correct parts

Computer Awareness Activity

Curriculum Areas

Language Arts
- Outlining/Planning
- Writing
- Oral Presentations
- Drama

Art
- Drawing/Graphics

Objectives

- To review computer knowledge
- To prepare a presentation for an identified audience
- To plan, develop and write a script for 3 - 4 people
- To give an oral presentation with visual aids (10 minutes)

How This Activity Relates To Computer Literacy

In reviewing knowledge acquired from previous computer activities, students identify those things they now know and prioritize their learnings for importance. In identifying key computer concepts to teach to others, and in teaching them, they contribute to the awareness level of their school or local community.

Teacher Options

- Content for presentations (assigned by teacher or chosen by students)
- Type of visual aids (drawing, roll-a-scroll, transparencies, costumes and/or models...)
- Scope of audience for presentations (within school or extend to community)
- Size and composition of groups working together (you choose or they choose
- Format for presentation - game show, modified folk tale, nursery rhyme, et

Materials

- Visual aids selected (see options)
- Duplicate planning sheets (appendix)
- Wall chart paper for lists
  - "Things I Learned.."
  - Content Calendar chart for presentations
- Costumes/props, if needed

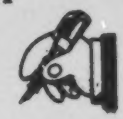
Time

For teacher demonstration: 1 hr.

For student activity: 6 hours

Time span suggested for this activity: 14 days

Teacher Preparation



- Have students gather all of their previous activity work together in a folder.
- Choose content you want students to review/teach to others and list on wall chart along with group names (or space for sign-ups) and the calendar dates for the presentations.
- Duplicate planning sheets after modifying to fit your situation:
  - audience
  - type of presentation, etc.
- Complete a planning sheet to use as a model in the teaching activity - include a sample script so they can see what's expected.
- Arrange with other classrooms/groups for 3 selected presentations to be given.
- Prepare a peer evaluation sheet.

Prior Skills Needed By Students

- Group cooperation
- Speaking in front of a group
- Knowledge of myths, fairy tales or folk stories to be modified for presentation.

The Great Computer Show 18

Teaching Activity

- Have students arrange completed work in order.
- Starting with Activity #1, elicit and record statements from students about what they learned from each activity:
  - one list for things learned - general knowledge or practice
  - one list for things learned about computers .

Note: If you did <u>all</u> of the activities this will take quite a while and will form a very impressive list. Divide it up over a several day stretch and have students compose the list as a letter to their family (hand-writing assignment?) which they take home at the end for a signature.

- Describe the teaching task/presentation they will be doing.
- Distribute planning sheets to <u>each</u> student and discuss options.

Guided Practice

- Model for students the process you went through in planning your presentation and writing your script.
- Go over content/calendar chart and arrange students in groups.
- As a whole class, go over the planning process-circulating to help each group and stopping the whole class to share ideas and clarify directions.
- Have groups report planning efforts to whole class to brainstorm creative setting for lessons/presentations (game show format, *fairy tale/myth format detective story, etc.), and brainstorm obstacles/solutions.

- Groups may continue independently until script writing when you conference with them. (See appendix.)

Independent Activity

- Have script available as model. Give out criteria sheets to evaluate presentations so that students will know how they'll be evaluated.
- Students work over a 3-week period - 1 week on script - 2 weeks on props and rehearsals as it fits into the daily schedule.
- Dress rehearsals are in front of the rest of the class (and invited parents?)
- Top 3? presentations performed for outside audience.

Extension Suggestions

- Schedule appropriate presentations for performance at community groups.

* Note: The "High-Tech Fairy Tale" has some real possibilities...Have students remember fairy tales and consider how computer knowledge or application information could be inserted to solve problems:

"Goldilocks and the 3 Bears"
(Microwave/Porridge)...

or "The High-Tech Nursery Rhyme"

"The Old Woman Who Lived in a Shoe"
(keeping track of children, etc.)
Hmmm....

- Group planning and presenting

Sharing

- Each student in a group completes:
  - "Things I Learned" lists
  - Planning Sheet
- Group presentation is judged on preselected criteria by peers.

Evaluation

Appendix

The materials in the appendix section of this guide from page 53 through page 84 are free of COPYRIGHT restrictions. They may be duplicated for use with students in the classroom.

The appendix is a collection of additional ideas and samples designed to complete the activities described in the lesson plans. Supplementary information includes:

- sample student worksheets
- suggested wall chart designs
- teaching strategies
- organizational suggestions
- additional directions
- illustrations
- implementation guidelines
- models of completed projects

These materials are in many cases critical to the use of the lesson plans. It is suggested that you use them in the following ways:

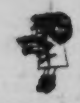
1. Refer back to the lesson plan to see how materials will be used.
2. Adjust the suggested usage to your teaching situation and students.
3. Translate and develop the ideas into teaching aids and student materials

Models and Samples

The lesson plans often require three to six hours of preparation activity. Additional ideas and directions given here in the appendix should help make that preparation easier. Some of that time will be well spent in making models or samples of what a finished student product should look like.

This will sometimes better illustrate what you want students to do. It will also give you an idea of the difficulty level of the activity and let you begin to break the tasks down into small steps which students can do successfully.

Another successful strategy is to physically model those steps in front of the class. Demonstrating how to create the product and handle materials is critical to some student's learning style. Have students repeat back to you important steps in the activity. This will increase student success.



Gathering Materials and Supplies

Many of the lesson plan activities require that you gather a variety of materials and equipment prior to teaching the lesson plan. While materials are different for each lesson, there is a consistent core of supplies which you May want to have on hand. They are listed below.

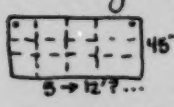
- white rolls of butcher paper
- large sheets of newsprint
- masking tape
- tacks or "push pins"
- colored marker pens (non permanent water colors) for wall charts
- Large manil a envelope or folder (for completed work)
- duplicating paper
- overhead transparency sheets
- construction paper
- graph paper (¼" to 1")
- crayons
- colored pencils
- colored markers (thin)
- pencils
- rulers
- chalk
- magazines } for pictures
- newspapers }
- glue
- Scissors
- yardstick

Bulletin Boards

The student materials created as a result of the lesson plans are excellent samples for bulletin boards. The wall charts used to gather and organize data will often replace traditional bulletin boards saving you time and creating additional work space (vertical!) for students.

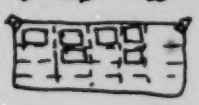
Wall Charts

The large information charts can be prepared in three ways.

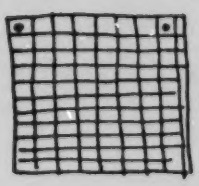
1. 

The long charts can be prepared with lengths of butcher paper from a roll.

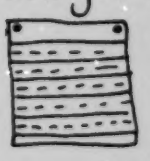
2.
They can be formed from a series of pieces of chart paper taped together and overlapped.

3. 
Smaller pieces of paper can be used to record information and then stapled or taped to a length of paper.

Writing out the organizational labels and titles on the chart is best done while flat on a table or the floor. A yardstick can help mark out columns and rows.



Using lined or 1" grid chart paper is helpful if you tend to write downhill or crooked.



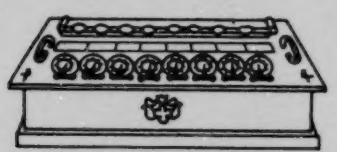
Encourage students to write clearly and large enough to read from 10' away.

Appendix, cont'd

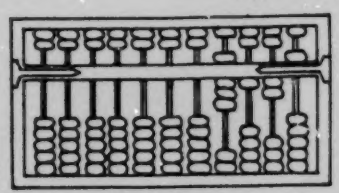
The computer history below is a summary of SOME of the information in the articles listed in the bibliography on the next page. For a more detailed history, you will want to use the sources given which are appropriate for your students. The activities are more interesting and meaningful IF connected to something in the students' experience. Bringing in photos of their own ancestors and discussing differences in appearance and lifestyle is one possible link to this lesson, especially for younger students. Older students may want to show the evolution of the car or the lightbulb.

2 A 2-page computer history with pictures

Earliest man only had fingers and toes to help him calculate. The Egyptians used sand pebbles until the abacus was devised. The abacus was used throughout the ancient world.



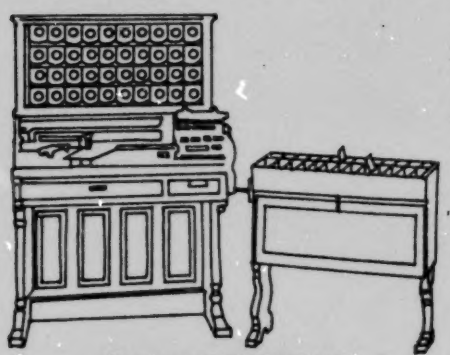
Pascal's Arithmetic Machine



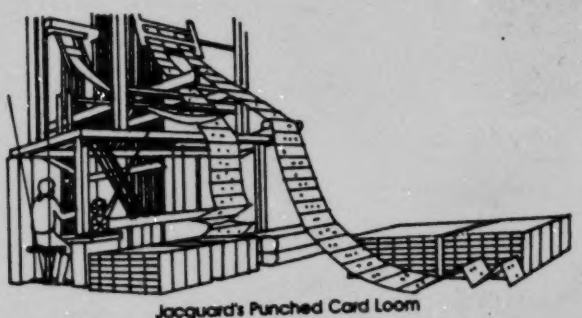
Abacus

Finally in 1642, a Frenchman named Blaise Pascal built an adding machine of a series of gears and wheels. The machine could only add and subtract at first. Other inventors improved the machine and eventually it was made to multiply and divide and even run on electricity. It was named La Pascaline.

In 1801 another Frenchman, Joseph Jacquard, invented a loom regulated by punch cards. He coded the cards to indicate which thread was to be used where in the pattern of the fabric being designed. Each punched hole represented a certain thread. The punched cards were inserted into the machine, and the fabric was woven according to the cards. Jacquard was probably the first person to program a machine even though the machine couldn't calculate. The machine was known as the jacquard loom.



Hollerith's Tabulating Machine



Jacquard's Punched Card Loom

An Englishman, Charles Babbage, wanted to develop a machine that could do the four arithmetic functions: add, subtract, multiply, and divide; solve problems; as well as do sixty additions a minute by reading punched cards. The machine could never be built because man lacked the knowledge of making precision metal cogs and wheels. However, the designs contained many ideas that are present in modern day computers including the idea of storing and following instructions of a programmer. He called his design the "analytical engine."

In the 1880s an American named Herman Hollerith developed a code that was designed to use punched cards for recording and sorting data. He also invented an electrical tabulating machine that read the information from the cards. The machine and code were first used in 1890 to record, sort, and read the information gathered by the 1890 census. The information from the 1870 census had taken six years to compile. Preliminary information from the 1890 census was ready in six weeks, and the whole job was completed in two years.

By 1890 the adding machine had been invented, but it was not until 1944 that Dr. Howard Aiken developed an electronic calculator at IBM. This was during World War II. A calculator was needed to help the military decide where to aim artillery shells against the enemy. This calculator, called the Mark I, was huge and was able to do three addition problems a second. While that may not seem fast today, it was a big step toward the modern computer.

In 1947, again because of the military, another calculating machine was developed by John W. Mauchly and J. Presper Eckert Jr. It was called ENIAC (Electronic Numerical Integrator and Calculator). ENIAC weighed 30 tons, occupied 1500 square feet of space, was nine feet in height, and contained more than 18,000 vacuum tubes. It could do 5,000 additions in a second.

ENIAC

In 1945 while Eckert and Mauchly were developing ENIAC, Dr. John Von Neumann reasoned that the binary numbering system was the most effective system for computer use as it only uses two digits (0, 1). He also suggested that the computer's control instructions and data be kept inside the computer. To use ENIAC's data, the control instructions were fed into it by paper.

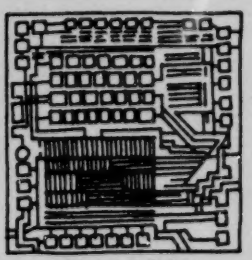
Mauchly and Eckert took Neumann's ideas and developed UNIVAC (Universal Automatic Computer) for Sperry Rand in 1951. UNIVAC was faster, being able to add 237,000 five digit numbers in a minute and check itself for errors. It was much smaller than ENIAC, taking up approximately 600 square feet of space and weighing four tons. But it still used vacuum tubes, skinny, light bulb-like tubes.

With the development of transistors in the 1960s, the miniaturization of computers began. Then, in the late 60s and early 70s, engineers at Intel discovered a way to reduce electronic components into integrated circuits to layer them on a silicon chip less than a centimeter square.

Sperry Rand still makes big computers such as UNIVAC, and in early summer 1982 introduced its latest model. It can process 25 million instructions a second! IBM's Model 3380 is even faster!

In the microcomputer industry, engineers are devising ways to increase the amount of storage on a chip to a quarter of a million bits of information.

■
Actual-Size Chip



Enlarged Chip

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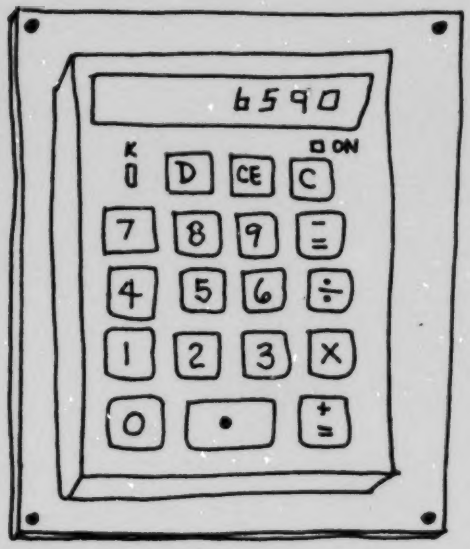
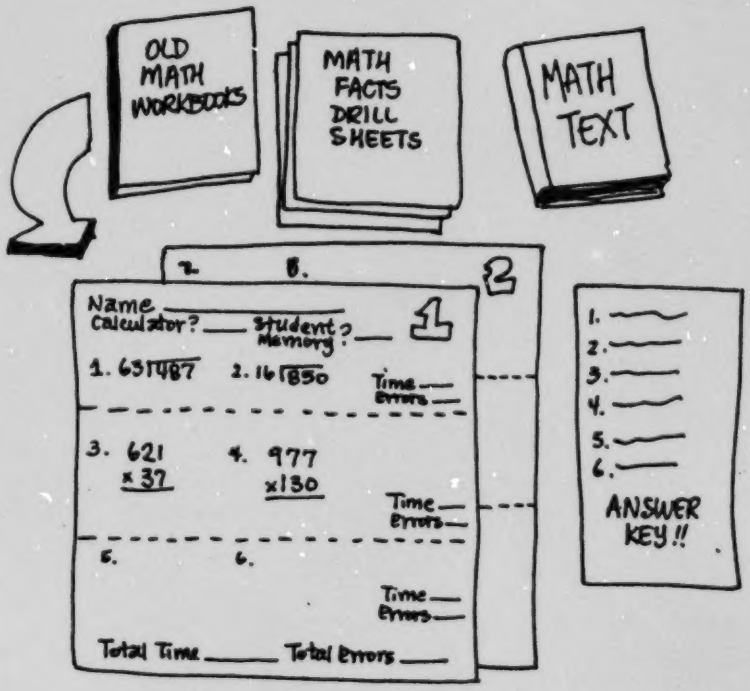
Kenyon, Raymond C., I Can Learn About Calculators and Computers, Harper and Row, New York, 1961
"Computer Tutor," Learning Works, Inc., Markle, Sandra, 1981
Richman, Ellen, Spotlight on Computer Literacy, Random House, New York, 1982
"Sperry Unit Unveils High Power Models in Computer Line," Wall Street Journal, July 30, 1982

3 "COMPUTING RACE"

BUTCHER PAPER AIDS and IDEAS



BUTCHER PAPER CALCULATOR PAD FOR TEACHING



Make worksheets for students of review problems appropriate to their ability. Students working in pairs each need a copy. One will complete the problems using a calculator, the other will do them the long way.

Students will need to use a watch, clock or stop watch with a second hand if "racing." Younger students may need a parent volunteer or older student to be the timer!

Make a large graph for groups or pairs to record their results for discussion.

COMPARING TIME AND ERRORS

m: minutes
s: seconds

Teams	Review Sheet 1 (1-6) Calculator Time	Calculator Error	Review Sheet 1 (1-6) Student Memory Time	Student Memory Error	Review Sheet 2 (7-12)		Totals Calculator Time	Totals Calculator Error	Totals Student Memory Time	Totals Student Memory Error
1 Mike, Jan	4m. 10s.	1	10m. 15s.	3			9m. 32s.	1	21m 4s.	4
2 Lynn, Eric										
3										
4										
5										
6										
7										
8										

★ For this lesson plan, the field-testers said organization was the key. Consider these tips for helping it run smoothly:

1. Be sure to collect students' calculators brought from home, especially for younger students, and mark with masking tape the name of the owner.

2. Since many calculators have different numeric pads and the position of the function keys tends to vary, you may want to spend ample time discussing this with students and letting them get acquainted with their calculators several days prior to trying the lesson plan. Without practice, student times will be FASTER than the calculator times!

3. For younger children (Grades 2 and 3), the large butcher paper drawing of a calculator pad is critical in teaching about calculators prior to this lesson. Ample modeling of operating sequences is necessary. Model the sequences of BASIC addition and subtraction, which keys to push and why. Let students who volunteer model the sequences by pushing the butcher paper keys. Spread the lesson out over a week's time. Students can begin to work in pairs - one on the calculator and one on paper - to practice problems and check each other's work. Gradually, some students may feel comfortable to try a "race."

4. Once older students have reviewed calculator operation, longer multiplication and division problems are dramatically solved faster on the calculator. Basic math facts (TIMES TABLES, etc.) will be FASTER by student memory - making the point that you DO still need to have that kind of knowledge for certain situations.

5. Math story problems given orally (REPEATED TWICE ONLY) can give students practice in both listening skills and math operations on the calculator. Over a period of time, students working in pairs will follow quite easily rather lengthy story problems. Stories can be humorous and designed around characters from short stories, movies, etc. to add listening motivation. The longer stories (10 minutes and UP!) need to pause after several operations and the right answer determined so that those who may get lost early can catch up and continue. To keep a pulse on how pairs are doing and which operations are creating problems, students stop at pause breaks and write the current answer on a piece of paper which they hold up for you to see. Have students with the correct answer explain the calculator sequence and their rationale to the rest of the class.

Here is a "short" story problem for students who have become comfortable with both calculator and oral story problems. It is most appropriate for students in grades 5 through 8. The ending is left for you to finish...

COUSIN MARVIN'S PICKLE FACTORY

Cousin Marvin owns a pickle factory in Idaho. He has a history of bad luck that is just incredible. Last fall, Marvin was a rich man. He had $5,740 in his savings account. By November, he had doubled his savings with profits from pickle sales. In December, the bad luck began. Pickle sales of "Marvin's Big Dills" began to fall off. He added only $1,352 to his savings account. To get the factory workers to work harder, Marvin gave each employee (40 of them) a $100 bonus for Christmas. This took a big bite out of Marvin's savings. (PAUSE!) Then Marvin's "pickle-stuffer" machine went out and he had to make an $1,800 down payment on a new one! In January, Marvin banked only $935 in profits. The rains in February flooded the factory and Marvin had to buy "hip-waders" for 20 of the employees ($15 each) and pay $630 for boxes of KLEENEX for workers' runny noses. (PAUSE!) March brought a workers' strike and no profits were made. Profits were up in April due to a national fad pickle diet and Marvin banked $3,915. In May, he slipped on a banana peel and fell off the loading dock breaking his leg. For May, June and July, Marvin had to hire a foreman to take his place at $1,300 a month. The foreman embezzled funds from Marvin's account three times - $850 in May, $4,612 in June, $2,320 in July - to pay gambling debts. (PAUSE!)..."

cont....

The story can carry into a "soap opera" format from day to day with changing crisis and introducing new characters along with different kinds of math operations. When calculators are no longer available, students can use their "Output Cards" which they will make in lesson plan #8 "HOW A COMPUTER WORKS". Students will then need to use a lot of scratch paper and you will need to allow longer pauses for calculations.

ENJOY!

4 Sample wall charts, interview sheets, P.G.&E. bill

This lesson plan will result in a completed retrieval chart like the one below. It may take several charts to hold all the information.

Retrieval Chart for Computer Career Interviews

A suggestion: * Fill in one row as a model (even hypothetical!) of what students will do.

Name Business	Computer Career Title	Type of Computer uses in the business (s)	Training?	Type of computer or programs	What problems or benefits does computer use make in your career/job? (− +)
* Mrs. Madge Jensen (Dr. Miller's office)	Bookkeeper and Receptionist	1. patients' records - visits, lab work 2. billing - what's owed, what's paid 3. word processing - letter writing and supply ordering	All - on the job training last year	• Apple III Business Computer • Commercial software for doctors	+ easier to keep track of who owes what − sometimes "zap" files by mistake and have to redo + faster letter writing
Mr. Simon Cardwell (Allied Insurance)	Insurance Agent				
Ms. Linda Baker (Marvel Travel)	Travel Agent				

Finding cooperative businesses requires spelling out exactly what you need!

BUSINESS CONTACTS – SAMPLE LETTER

Oct. 3, 1983

_____
_____
_____

Dear ,

During November, my 7th grade career class will be studying computer-related jobs and how businesses use computers. I am hoping to locate __ people from local businesses who would be willing to participate in a 10-minute phone interview with one of my students. The interview sheet is on the back should you choose to participate.

I will be calling you on Oct. 15th in the afternoon to see if you would be willing to help us in any of the following ways:

__ 1. participate in the phone interview, or
__ 2. mail in the completed interview sheet, or
__ 3. come to the school to be interviewed, or
__ 4. allow a small group (3-5) of students to observe for 20-minutes your computer use.

Thank you for considering participation.

Sincerely,
Tomas Markham
Johnston Jr. High

Phone: 446-3058

INTERVIEW SHEET
(SAMPLE)

STUDENT _____
PERSON INTERVIEWED _____
BUSINESS _____
ADDRESS _____
_____
PHONE _____
DATE OF INTERVIEW _____
TIME _____ LENGTH ____ min.

- CAREER TITLE: _____
- HOW COMPUTER IS USED IN BUSINESS:
  1. _____
  2. _____
  3. _____
- TRAINING:
- TYPE OF COMPUTER: _____
  PROGRAMS: _____
- +'s Benefits of computer | −'s Problems with computer

Try putting this on an overhead transparency. As you interview the first person during class, model how you would take notes during an interview as you ask the questions.

The P.G. and E. utility bill has been enlarged so that you can make copies for students as part of a lesson. Students can try to identify the types and amount of information a business must deal with AND the problems involved. Help students list all the types of information P.G.&E.'s computer must store and sort as evidenced on this bill. It may lead into discussions on other types of bills issued by businesses using computers and the types of information common to many of them. Students may want to ask an interview question about how all this was handled BEFORE computers. (SAVE ALSO FOR USE IN ACTIVITY #9.)

When making inquiries contact our office at . . .

363 MERCHANT ST
VACAVILLE CA 95688
448-6235

PG and E

Your Account Number
FPK10 10301-5

Rate Schedule
G 1XH D B1XB

JULY,1982

ROTATING OUTAGE BLK 13

*GAS THERMS=DIFFERENCE BETWEEN METER READINGS TIMES MULTIPLIER

Type of Service	SERVICE PERIOD From	To	Billing Days	METER READINGS Prior	Present	Reading Difference	Multiplier	Gas-Therms* Elec KWH	AMOUNT
GAS	6 7	7 8	31	8088	8109	21	1.025	22	8.82
ELEC	6 7	7 8	31	30929	31335	406	1	406	23.55
ENERGY COMMISSION TAX									.08
TOTAL CURRENT CHARGES									32.45
PREVIOUS BALANCE									37.15
07/01 PAYMENT-THANK YOU									37.15-
TOTAL AMOUNT NOW DUE									**$32.45**

THE SUMMER LIFELINE ALLOWANCES YOU PRESENTLY RECEIVE ARE LISTED BELOW.

	GAS - 26 THERMS	ELECTRIC - 470 KWH	MINIMUM ELECTRIC CHARGE
LIFELINE ALLOWANCES	22 THERMS @ $0.40111	406 KWH @ $0.05800	$2.00
LIFELINE USAGE	0 THERMS @ 0.65459	0 KWH @ 0.07830	
OVER LIFELINE USAGE	0 THERMS @ 0.79454	0 KWH @ 0.10571	

G 1XH - GAS - BASIC NEEDS (COOKING, WATER HEATING).
D B1XB - ELECTRICITY - BASIC NEEDS (LIGHTING, COOKING, REFRIGERATION), AIR CONDITIONING.
IF THIS LIFELINE INFORMATION IS NOT CORRECT, PLEASE CONTACT THE OFFICE LISTED ABOVE.

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BILL PERIOD	DAYS	GAS THERMS BILLED	THERMS PER DAY	ELECTRIC KWH BILLED	KWH PER DAY
THIS MONTH THIS YEAR	31	22	.7	406	13.1
THIS MONTH LAST YEAR	32	23	.7	1313	41.0

COMPARE YOUR AVERAGE DAILY USE WITH LAST YEAR

127

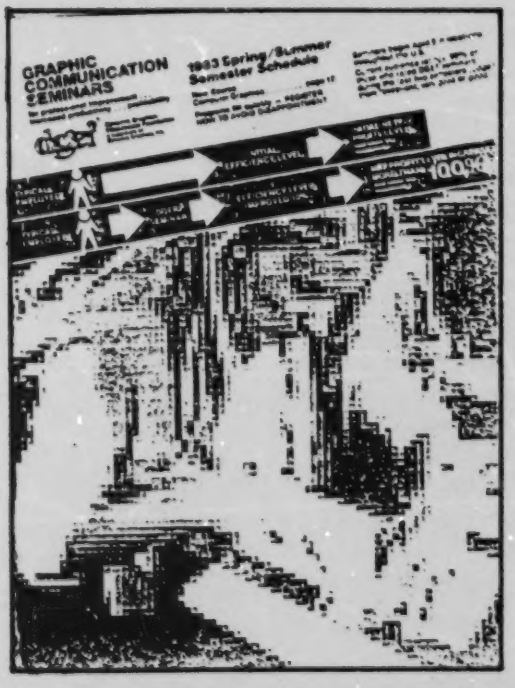
FPK10
10301-5

09

5 Sample graphic designs and pixel paper

Remind students of the designs they've seen in print or on t.v. that are computer generated. Some of the samples below may help in the teaching activity.

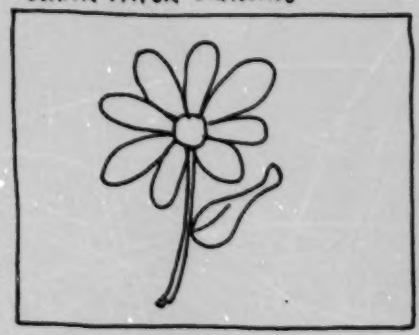
TRY TO FIND SAMPLES OF COMPUTER GRAPHICS

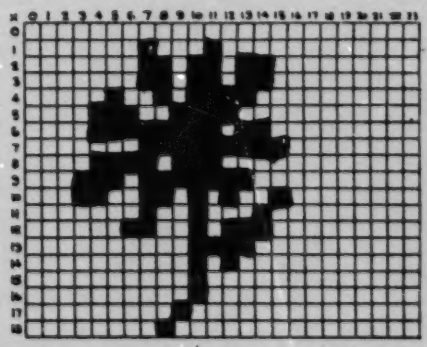


Students may have pictures also. Some fairs have booths where vendors copy your photo image on computer for $2.00+

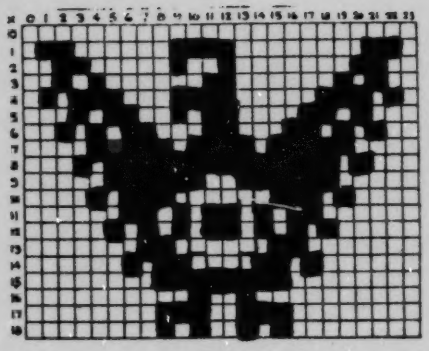
SAMPLES OF TRANSLATED DRAWINGS MIGHT INCLUDE:

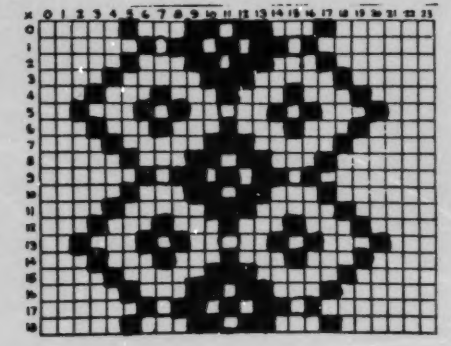
BLANK PAPER DRAWING





PIXEL PAPER TRANSLATION

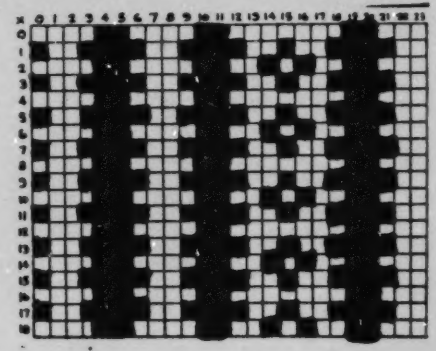




Besides translating pictures onto pixel paper, students can try using the grids to create their own designs. Social studies projects can be developed to go with American Indian studies or ancient civilizations units - Aztecs, Incas, Egyptians - who utilized similar design patterns for weaving and pottery.

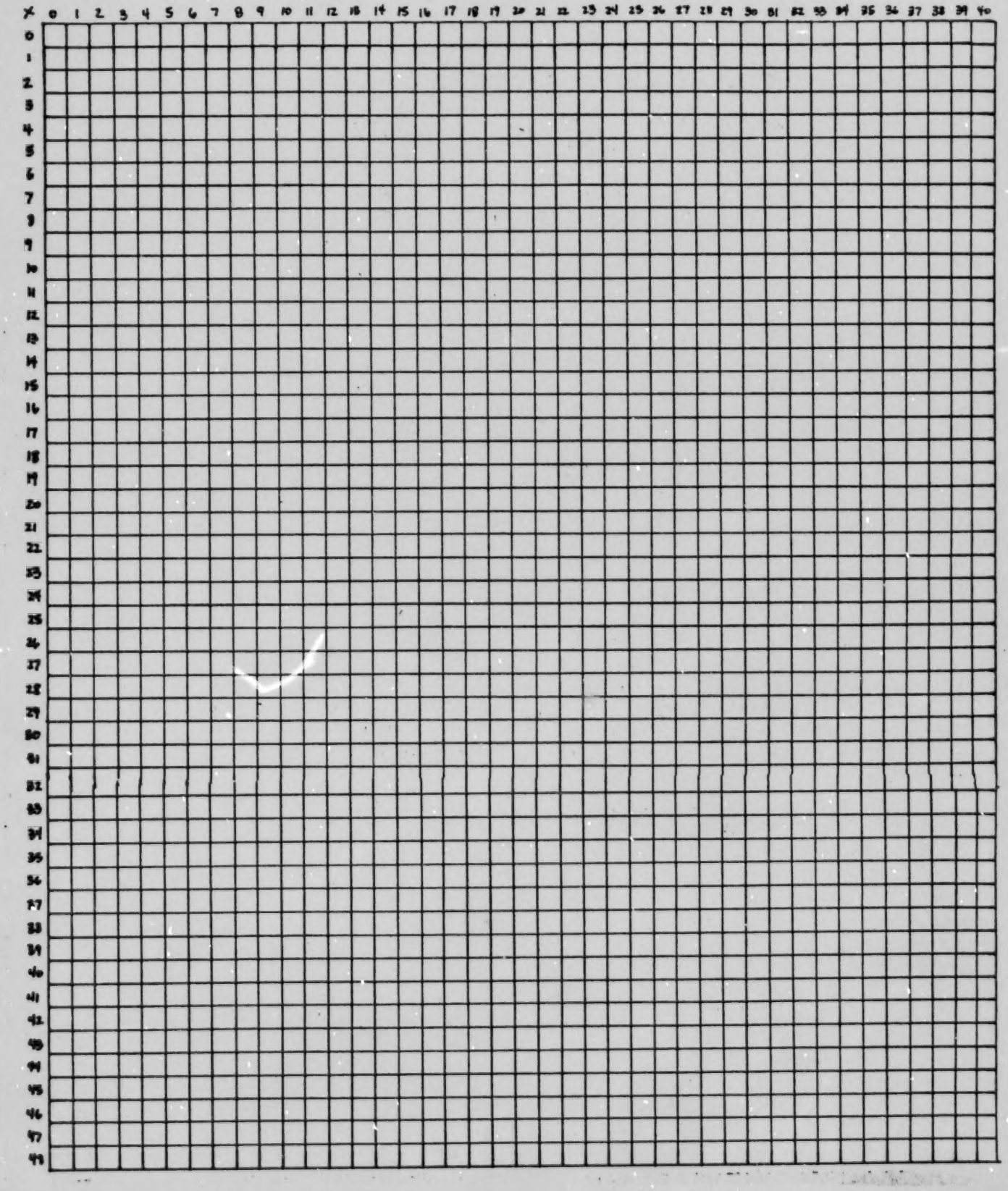
Older students can make more intricate designs. Designs can later be the basis for needlepoint projects or linoleum block prints.

Younger students can use simpler pixel patterns. Very large plastic mesh is available for needlepoint projects.



SAMPLE PIXEL PAPER

This piece of graphed pixel paper is ready for duplication. Students won't need to use the numbers until they begin "Lesson Plan #12, "Computer Plotting." Different brands of computers usually market tablets of pixel paper configured for their screen. More advanced students may want to create projects using the high resolution graphics (280 square by 192 square grid or 1/16" graph paper).


X
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48

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6 Sample tally sheet and graph

The process of conducting a poll needs to be outlined for students. These may give students ideas on how to organize their data.

Translating the information into graph form depends on the ability of the students. Younger students can use picture graphs such as the one below and use graph paper (½"-1").

PICTURE GRAPH Total poll = 60 kids (all 4th graders)

Polling Results for Computer Game Popularity

"Which of these is your favorite computer game?"

Computer Game	
1. PAC MAN	7
2. FROGGER	1
3. DONKEY KONG	5
4. CENTIPEDE	4
5. other: JOUST	3

1 picture = 3 votes

Generalization: Most 4th graders like PAC MAN or MS. PAC MAN because they can all play it easily and it moves fast. Frogger is too hard and it costs too many quarters.

Dates of Poll: _____ _____

Group Members: Shelly Jeanne Kris

TALLY SHEET

Group Members _____ Dates of Poll _____

Population: _____

Total # ____

Question: _____

CHOICES OF ANSWERS:	Tally	Total
1. Pac Man		
2.		
3.		
4.		
5. other		

Major Comments (why?):

Older students can get into sampling techniques, variables, etc. and more sophisticated descriptions and graphing procedures.

7 Sample vocabulary and preview questions

- calculate
- century
- diary
- insert
- "very superior eyes" (p.38)
- dispute
- mechanical
- nonchalant
- loftily

From the story, "The Fun They Had," here are some vocabulary words and questions to put on the board for discussion prior to and after reading the story.

1. What did Tommy find?
2. Why did he think it was a waste?
3. Why did Margie hate school?
4. What mistake did Margie make about teachers? About schools?
5. How were they being educated? Where?
6. What are some advantages of going to school as we do now? Some disadvantages?
7. What would be some advantages and disadvantages of learning at home by computer?
8. What is the theme of the story?
9. Why is this story a science fiction story?

8 "Output card" samples and usage suggestions

JOBS WE DO THAT ARE LIKE THE COMPUTER:

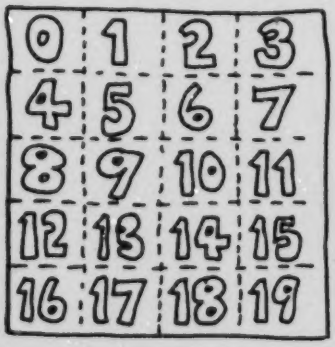
HAVE STUDENTS COMPARE COMPUTER FUNCTIONS TO THESE JOBS TO SEE IF THEY ARE ALIKE!!

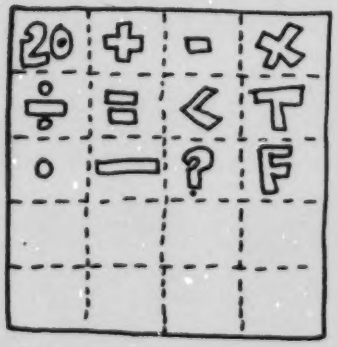
1. Following a cooking recipe.
2. Studying for a test.
3. Assembling a model.
4. Sewing from a pattern.
5. Executing a football or basketball play.
6. Mowing the lawn or doing the dishes.

ETC.!!

OUTPUT CARDS

sheets of tagboard - ditto numbers



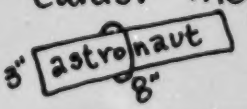


BOTH SIDES OF THE CARDS CAN BE USED!

☐ ? BLANK CARDS can be used for:

- Geometric Shapes
- Algebra Symbols
- Colors
- Word Families
- Alphabet
- Punctuation Marks

Special sets of cards can be made on regular paper for short-term use. Vocabulary development for science, math, social studies, reading, economics, health or foreign language can be reinforced with output cards. They need to be longer in length.



cont.

A SAMPLE
DRAWING FOR BOARD

HINTS for USING THEM

1. Emphasize quick and quiet "set up" of cards on students' desks or tables.

2. Award points at the end of each session for active participation and sincere effort. Demonstrate problem areas correctly.

3. Be prepared! Select problems ahead of time and plan math operations. Have answer key available.

4. For story problem-solving involve humor and real situations students can understand (Cousin Marvin's Pickle Factory - Activity # 3 - Computing Race). Math applications in the real world have more meaning.

5. Emphasize good listening. Repeat each problem (or portion of a story problem) only twice.

6. Allow ample time for students to compute the answer, locate the correct cards (or combination of cards!), and hold them up so you can see their responses. Acknowledge correct responses quickly with an "Okay" as your gaze sweeps the room.

7. For incorrect responses on story problems, have a student or pair of students correctly demonstrate on the board the operations and rationale for getting the right answer. Students with incorrect responses are encouraged to identify the reason for their error. Encourage problem-solving dialogue!

8. For incorrect responses on computational problems, use a similar process if the error rate is high throughout the class. Repeated error on the part of only a few students is a signal to reteach them at another time.

9 Sample checklists, wall chart, inventory sheet

SCAVENGER HUNT CHECKLIST - COMPUTER-RELATED ITEMS

for younger students, consider developing this list into individual or group worksheets. Directions could include ALL or SOME of the following. You may want to split up the list into several worksheets and give over a several day span. As students become more knowledgeable, you may want to try a competitive hunt.

SOME POSSIBILITIES:

- Hospital lab test results
- Newspaper (most done on a word processor!)
- Airline ticket stub
- Microwave with memory
- Digital clock, watch or clock
- Digital scales
- Programmable sewing machine
- Push button or programmable telephone
- Calculator
- Income tax forms
- Vehicle registration
- Programmable toys (Big Trak, cars, boats, robots, dolls, hand-held games, etc.)
- Video games
- Learning machines ("Speak and Read", "Little Professor", "Touch and Tell", "Discovery System")
- Alpha Beta (or other) check guarantee card
- Versatel (or other) bank instant cash card
- Can with UPC (inventory) code [redacted] on label
- Grocery receipt from store with scanner
- Cancelled check
- P.G.& E. bill (or any other computer-produced billing)
- Instruments display on new cars (Digital and "talking" messages)
- Military and other paycheck stubs
- Voting ticket stub or registration card
- Memory typewriters
- Some video cassette recorders (memory)
- Some gasoline pumps
- Some traffic signals
- Home energy/light control timers

SALES CATALOGS ARE EXCELLENT SOURCES OF EXAMPLES OF COMPUTER GADGETS!

Managing Information

Consider using 3 types of recording devices.

1. EVIDENCE SLIP

Group #____ Student Providing Evidence _____

How does this item relate to computers?

DRAWING OF ITEM

Location: _____ Parent signature _____ Date _____

* Much of the evidence from home may be part of personal records or too big to bring in their sack to school. Students can fill out slips and bring for points to be posted on wall chart as part of team inventory.

SENDING HOME A LETTER TO PARENTS IN ADVANCE WILL BE A NECESSITY AND COULD BE AN ADVANTAGE TO THE SUCCESS OF THIS ACTIVITY!!

2. TEAM or INDIVIDUAL INVENTORY SHEET

Team #____ Inventory Sheet of Computer Evidence and Points

Date	Team Member	Item	Relation to Computers	Points Given
↓				

3. WALL CHART

Good essay information or creative writing: "Going on a Computer Safari" OR "The Case of the Hidden Computers" OR "101 Places to Find Computers" OR ...

TEAM	Weds. 2/7	Friday 2/9	Mon. 2/12	Weds. 2/14	Friday 2/16	TOTAL
#1 Mike Gina Lupe						# of items ____ Total points ____
#2 Kim Steve Orlando						# of items ____ Total points ____
#3 Kris ↓						# of items ____ Total points ____

These definitions are only a beginning selection of terms. Many of the books listed in the resource section of this guide have extensive glossaries. Starred items (*) are those which may be appropriate for the first two or three lessons. Have students use their picture files to find examples of as many terms as possible. With some background reading on your part, this lesson can become a real building block towards their literacy.

10 Beginning dictionary definitions

Application...System or problem that the computer has to solve

Arithmetic Unit...Calculations part of the computer where all arithmetic operations are performed

Binary System...The system that uses the digits 0, 1, and groups numbers by powers of two

* Bits...(BInary DigiT) storage cells in the memory of the computer

* Bug...A program error

* Bytes...A group of bits - eight bits to a byte

* Cathode-Ray-Tube (CRT)...The screen of the computer on which information is displayed

Central Processing Unit (CPU)...The processing and memory units of a computer made of integrated circuits

Character...A letter, digit, punctuation mark, or symbol found in the keyboard that gives the computer usable information when encoded

Chip...A silicon wafer layered with electronic components called integrated circuits. A microchip is less than 1 sq. cm.

* Command...An instruction to the computer by the programmer

* Computer...A device capable of accepting input, processing it, and delivering results as output. The heart of a computer is its memory. A computer usually has a display screen and an input device, i.e., keyboard.

Control Unit...The unit that coordinates the operations and directs the sequence of information and encoded instructions

* Cursor...The lighted or blinking symbol on the screen marking where the next character will be displayed

* Data...Information processed by the computer

* Debug...To locate and correct errors in a computer program

Decode...To translate to understand

Encode...To put a message into code

Floppy Disc...A disc that looks similar to a 45-rpm record that contains material that has been programmed or that can be programmed itself

* Hardware...The computer itself and its peripherals

Input...The data given to the computer; act of giving data to the computer

Appendix, cont'd

* Keyboard...Labelled keys used to feed information into the computer

* Mainframe...Large computer used in business

Memory Unit...Storage area of the computer

* Microcomputer...A small, desktop computer

Modem...Device that allows computers to communicate with one another via telephone lines

Output...Processed data ready to be used; act of receiving data from the computer

* Peripheral...Additional equipment for the computer; i.e., cassette player, printer

Printer...A device that prints the computer's output on paper

Printout...Output typed from the computer onto paper in a printer

* Program...Set of instructions put into the computer to solve a problem

* Programmer...Someone who gives instructions to the computer

RAM...Random Access Memory - read/write memory. You can read its data and write new data into it.

ROM...Read Only Memory - memory that cannot be added to; you can only read it.

* Software...Programs for the computer

Tape...A device to give the computer input

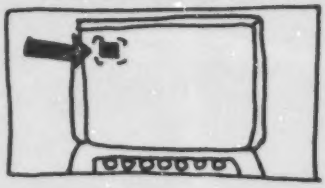
Word Processing...Using the keyboard of the computer to prepare materials that can be changed, recorded, saved, and/or printed

STUDENT DICTIONARY

Finding actual examples of terms will make them more meaningful to students. You may want to select only those terms which can be "touched" and bring in someone with a microcomputer to do a demonstration. Students will then have experience for the terms - keyboard, CRT, computer, cursor, hardware, peripheral, tape or floppy disc. Without this type of experience, it will be like learning a meaningless foreign language. Movies or sound filmstrips can also add to the experience.

A possible entry for younger students might include:

3. **Cursor** (noun) A cursor is a blinking light on the computer's screen. It helps you mark your place so you don't forget where you were working. It's also a reminder that the computer is waiting for your turn.



You may want to wait and do this lesson plan after #18 as a summary activity or until you gain access to a computer.

Commands in BASIC

END	Instructions are completed.
LIST	Tells the computer to display a program
NEW	Tells the computer to clear out previous input and store new input
PRINT	Display the data that follows
RUN	Tells the computer to process the instructions given in the program

Programming Languages

BASIC	Beginning All-Purpose Symbolic Instruction Code - computer language designed for education but now used in business also
COBOL	COmmon Business Oriented Language - computer language used in business and data processing
FORTRAN	FORmula TRANslation - computer language used in math and science
LOGO	From the Greek for "reason" - language developed to instruct very young children on computers.
PASCAL	Named for Blaise Pascal, a French mathematician who invented the Arithmetic Machine in 1642
PILOT	Programmed Inquiry Learning Or Teaching - designed to generate teacher authored tests
PLATO	Programmed Logic for Automatic Teaching Operations -language used in business and industry for the instruction of employees

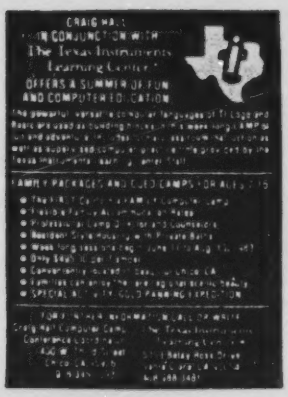
BASIC Programming Vocabulary

ENTER/RETURN	Key punched at the completion of each line
Flowchart	A graphic outline of steps to be taken to solve a problem
GOTO	Branches the program; leads back to an earlier step
IF...THEN	Branches the program; tests two numbers (variables or a combination) If the test is okay, the computer continues; if not, it goes to the next program line.
Initialize the Variable	Stating the variable is equal to some starting value
Line Numbers	Order of work; usually in steps of ten
Loop	A repetition; tells the computer to go back to an earlier part of the program
String Variable	Stored sequence of variables
SYNTAX ERROR	An oops; the response of the computer to misspelling or to the way a command is given
Variable	Something that can vary; stored information placed in the memory and given a name

11 Sample ads, letter and wall chart

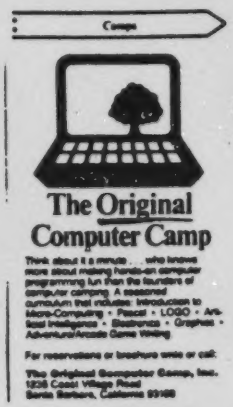
COMPUTER CAMP ADS

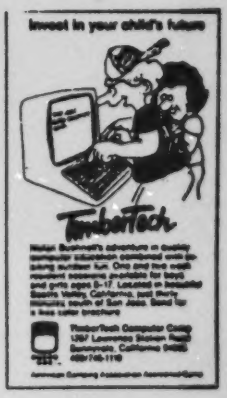
The following ads were taken from SUNSET magazine's front travel section. You'll want to locate a more recent issue and cut out ads.

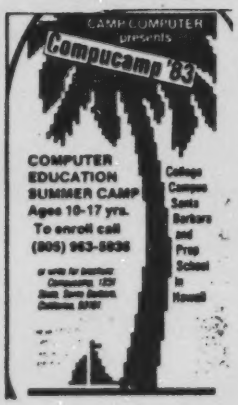


Not Just Another Summer Camp.
Learning is part of the fun at ATARI® Computer Camps.
• Coed, ages 10-16
• 2, 4, or 8 week sessions
• Convenient locations
• With or without computer skills
• Traditional camp activities
• Professional Camp Directors
CALL FREE 800/847-4180
ATARI COMPUTER CAMPS

COMPUTERS... LEARNING... AND FUN!!!
CompuCamp
Computer Camps for Boys and Girls 9-17
• 1 and 2 week sessions
• Self paced proven curriculum
• All levels of BASIC, Pascal, LOGO, and machine language
• Apple™ and all other computers
Camps held in California, Colorado, Minnesota, Oregon, Pennsylvania, Texas and Wisconsin
CALL or WRITE for FREE Brochure
In CA call collect Outside CA call
(818) 924-8725 1-800-233-3272
Presented By
GREAT AMERICAN SPORTS CAMPS
5766 Paradise Drive Suite 70
Corte Madera, CA 94925


Camps
The Original Computer Camp
Think about it a minute... who knows more about making hands-on computer programming fun than the founders of computer camping. A seasoned curriculum that includes: Introduction to Micro-Computing • Pascal • LOGO • Artificial Intelligence • Electronics • Graphics • Adventure/Arcade Game Writing
For reservations or brochure write or call:
The Original Computer Camp, Inc.
1238 Coast Village Road
Santa Barbara, California 93108





WALL CHART FOR INFORMATION RETRIEVAL

one possibility:

COMPUTER CAMPS

CAMP Name Address	Dates • Length Sessions	Age Groups	Computer Skills to be learned	Other Camp Activities	COSTS $	Type of Hardware	Other Information

MODEL LETTER

Jan. 26, 1984

Compucamp
1231 State
Santa Barbara, Ca.
93101

Dear Sir,

I am a student at _____ School. We are investigating the types of skills we could learn by going to a computer camp. I found your ad in the _____ magazine and would like more information about your camp.

Please send me a brochure and information about session dates, computer skills, other activities, costs and camp locations.

Sincerely,
Glenna Jacobs
735 Elm St.
Vacaville, Ca. 95688

When all of the responses are in and the information has been recorded on the wall chart, help students see patterns and trends in the data.

Even younger students can begin to generalize from the data by listing things that seem to be true about the computer camps you studied.

Most Computer Camps.. seem to...

1. charge about $500 a week per person
2. be sponsored by computer hardware companies
3. have both computer activities and other recreational activities available
4. be located on or near college campuses
5. aim towards students aged 10-17 etc...

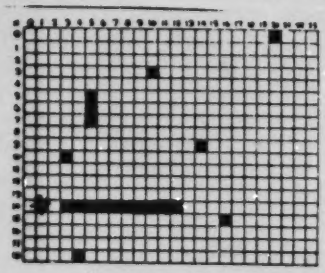
Many of the Extension Suggestions can be done using this information and additional information from brochures. Students who have attended a computer camp can add their experiences.

12 Plotting squares, designs, programs and ideas

GRAPHIC PLOTTING

For this activity you can use the sample pixel paper on page 62, real pixel paper for very advanced students or regular graph paper which students have numbered both rows and columns.

Younger students grasp easily the concept that each square has an address that they can use to find its location. Each address has two numbers. The first one is **ALWAYS!!** the horizontal or "across" position and the second number gives the vertical or "down" location. Where the two locations meet is the square. Give students some addresses to practice. Using a ruler or edge of a paper or book will help them stay in the correct row and column.



(10, 3)
(3, 10)
(20, 0)
(14, 9)
(4, 18)
(5, 5)
(5, 6)
(5, 7)
(16, 15)

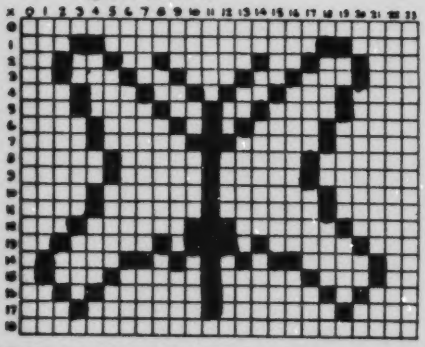
* See bottom of page

When students have mastered the concept, have them practice some of the programs plotted below until they can:

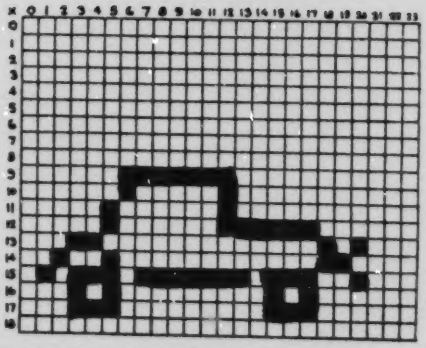
1) fill in designs from a plotting program.
2) fill in a plotting program from a design.

Then, students are ready to start writing and designing their own plotting programs for each other! More complex designs are shown on page 61.

BUTTERFLY



CAR



Help students organize the plotting programs they write by making a worksheet. Minimum spaces for commands ? 100.

1.(1,14)	18.(5,2)	35.(10,13)	52.(12,13)	69.(18,7)
2.(1,15)	19.(5,8)	36.(11,5)	53.(13,3)	70.(18,10)
3.(2,2)	20.(5,9)	37.(11,6)	54.(13,6)	71.(18,11)
4.(2,3)	21.(5,15)	38.(11,7)	55.(13,14)	72.(18,16)
5.(2,13)	22.(6,3)	39.(11,8)	56.(14,2)	73.(19,1)
6.(2,16)	23.(6,14)	40.(11,9)	57.(14,5)	74.(19,4)
7.(3,1)	24.(7,4)	41.(11,10)	58.(14,13)	75.(19,5)
8.(3,4)	25.(7,14)	42.(11,11)	59.(15,4)	76.(19,12)
9.(3,5)	26.(8,2)	43.(11,12)	60.(15,14)	77.(19,17)
10.(3,12)	27.(8,5)	44.(11,13)	61.(16,3)	78.(20,2)
11.(3,17)	28.(8,13)	45.(11,14)	62.(16,14)	79.(20,3)
12.(4,1)	29.(9,3)	46.(11,15)	63.(17,2)	80.(20,13)
13.(4,6)	30.(9,6)	47.(11,16)	64.(17,8)	81.(20,16)
14.(4,7)	31.(9,14)	48.(11,17)	65.(17,9)	82.(21,14)
15.(4,10)	32.(10,4)	49.(12,4)	66.(17,15)	83.(21,15)
16.(4,11)	33.(10,7)	50.(12,7)	67.(18,1)	
17.(4,16)	34.(10,12)	51.(12,12)	68.(18,6)	

1.(1,15)	18.(7,9)	35.(14,12)
2.(2,14)	19.(7,15)	36.(15,12)
3.(3,13)	20.(8,9)	37.(15,15)
4.(3,15)	21.(8,15)	38.(15,16)
5.(3,16)	22.(9,9)	39.(15,17)
6.(3,17)	23.(9,15)	40.(16,12)
7.(4,13)	24.(10,9)	41.(16,15)
8.(4,15)	25.(10,15)	42.(16,17)
9.(4,17)	26.(11,9)	43.(17,12)
10.(5,11)	27.(11,15)	44.(17,16)
11.(5,12)	28.(12,9)	45.(17,16)
12.(5,14)	29.(12,10)	46.(17,17)
13.(5,15)	30.(12,11)	47.(18,13)
14.(5,16)	31.(12,12)	48.(18,14)
15.(5,17)	32.(12,15)	49.(19,14)
16.(6,9)	33.(13,12)	50.(20,13)
17.(6,10)	34.(13,15)	51.(20,15)

Student _____
Date _____
PLOT PROGRAM
Design: _____

1.	11.				
2.	12.				
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					

*Making a line takes many plotting addresses. A short cut is to use a VLIN (vertical) or HLIN (horizontal) statement in the program. The statement "HLIN 3,12 at 14" tells the person (or computer) to fill up the squares across the grid screen from 3 to 12 at 14 squares down from the top of the screen. (Try to modify the 2 programs here!)

13 Terms and student worksheets

Alcoa	HUD	NATO	Scuba	WAVES
AWOL	laser	NOW	SEATO	ZIP Code
* BASIC	loran	* PILOT	UNESCO	
CARE	lox	* PLATO	UNICEF	
* COBOL	maser	radar	UNIVAC	
ENIAC	NASA	SAM	WAC	

The starred (*) acronyms above are names of computer languages. Their definitions and the words they stand for are listed along with three more computer languages on page 68. You may want to expand these definitions by using other information from books listed in the resource section of this guide. Some students may want to look at programs written in these languages.

TAGBOARD SIGNS FOR BULLETIN BOARD

BASIC FORTRAN PASCAL

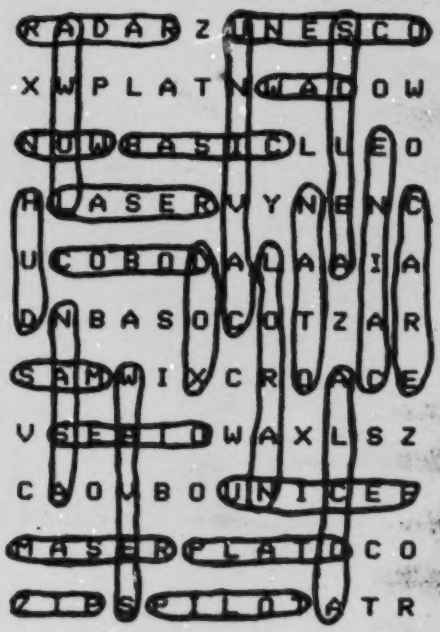
COBOL LOGO PILOT PLATO

Students can recall what it was like trying to program a robot in Activity #1 and in plotting a graphics program in Activity #12. Programmers use different languages to give directions to the computer.

Students can look at other acronyms by using a word search:

R A D A R Z U N E S C O
X W P L A T N W A C O W
N O W B A S I C L U E O
H L A S E R V Y N B N C
U C O B O L A L A A I A
D N B A S O C O T Z A R
S A M W I X C R O A C E
V S E A T O W A X L S Z
C A O V B O U N I C E F
M A S E R P L A T O C O
Z I P S P I L O T A T R

ANSWER KEY



Acronyms - Dictionary Search

Look up the following acronyms and discover what words they stand for. For example: BASIC stands for Beginning All-Purpose Symbolic Instruction Code, and FORTRAN for FORmula TRANslation.

1. AWOL	6. lox	11. radar	16. WAVES
2. CARE	7. maser	12. SAM	17. UNESCO
3. HUD	8. NASA	13. Scuba	18. UNICEF
4. laser	9. NATO	14. SEATO	19. UNIVAC
5. loran	10. NOW	15. WAC	20. ZIP Code

Acronym Challenge

An acronym is a word made up of the initial letters of other words. BASIC stands for Beginning All-Purpose Symbolic Instruction Code, and FORTRAN is made from FORmula TRANslation.

Below are some full titles from which common acronyms are made. Read each and think of an acronym for each. The number of letters in the acronym is indicated on the right.

1. Absent Without Leave (4) _____
2. Cooperative for American Remittances to Europe (4) _____
3. Department of Housing and Urban Development (3) _____
4. light amplification by stimulated emission of radiation (5) _____
5. long-range navigation (5) _____
6. liquid oxygen (3) _____
7. microwave amplification by stimulated emission of radiation (5) _____
8. National Aeronautics and Space Administration (4) _____
9. North Atlantic Treaty Organization (4) _____
10. National Organization for Women (3) _____
11. radio detection and ranging (5) _____
12. Surface-to-Air-Missile (3) _____
13. self-contained underwater breathing apparatus (5) _____
14. Southeast Asia Treaty Organization (5) _____
15. Women's Army Corps (3) _____
16. Women Accepted for Volunteer Emergency Service (5) _____
17. United Nations Educational, Scientific, and Cultural Organization (5) _____
18. United Nations International Children's Emergency Fund (6) _____
19. Universal Automatic Computer (6) _____
20. Lone Improvement Plan Code (3) _____

Now use the dictionary to check your guess.

Ready for duplication!

14 Sample wall chart and worksheets

REFERENCE MATERIALS & IDEAS

- FILMS and FILMSTRIPS for the periods mentioned
- TEXTBOOKS - U.S. and WORLD HISTORY
- ENCYCLOPEDIAS
- ★ SOME ANNUAL SUPPLEMENTS or YEARBOOKS for ENCYCLOPEDIAS (World Book)
- THE WORLD ALMANAC (old Editions)
- LIBRARY BOOKS

While adaptable to students in grades 4 to 8, it is appropriate for even older students. It assumes a high degree of experience with reference materials and the ability to locate information.

The chart designed below is a long-term project. By reducing the number of columns or rows, the project becomes much more manageable. The last two column topics may be more interesting to students.

CHANGES and EVENTS 1890 to 1970 COMPUTER HISTORY

Team Assigned	COMPUTER DEVELOPMENT MORE INFO.	Wars & Major Political Events U.S. President?	Other Major Inventions & Discoveries	IMPORTANT STATISTICS U.S. Population etc.	Heroes and Important People	Daily Lifestyle Facts	→
#1	1890 ADDING MACHINE						
#2	1944 ELECTRIC CALCULATOR						
#3	1947 ENIAC CALCULATOR						
#4	1951 UNIVAC COMPUTER						
#5	1960 TRANSISTOR						
#6	1970 CHIP						

1980?

This column alone could allow interesting projects and allow students to become familiar with the different computer developments. The culmination activity would be to analyze (questioning strategies) the chart data and look for any cause and effect relationships in the rows of information and write or list any generalizations about life in the 1950's, etc..

15 Sample ads, worksheet, advertising techniques

FAVORITE T.V. COMMERCIALS (whole class)

Product	Describe What Happens in Commercial	WHY DO YOU LIKE IT?	POSSIBLE AD TECHNIQUE
1. Diet Coke			
2. Miller Beer			
3. Jordache Jeans			
4.			
5.			

Because of the large amount of t.v. viewing, ALL students will easily speak with authority and should be able to participate equally. They can work in pairs or teams to complete this worksheet. Points can be given as incentive. The results can be tallied on a wall chart like this one.

COMMERCIAL WORKSHEET Points /80 Name _____

ADVERTISE. TECHNIQUE	COMMERCIAL OR ADVERTISEMENT USING TECHNIQUE and DESCRIPTION (T.V. / PAD AD)	Points /4
1. STRAIGHT FORWARD AD		
2. SPECIAL OFFER		
3. EYE APPEAL		
4. HAPPY FAMILY APPEAL		
5. EXPERT OPINION		

ADVERTISING TRENDS in COMPUTERS Total Ads Analyzed = _____

Technique	Tally	Total Ads	Total Used	Frequency	Possible Reasons
1. STRAIGHT FORWARD				= %	
2. SPECIAL OFFER				=	
3. EYE APPEAL				=	
4. HAPPY FAMILY APPEAL				=	
5. EXPERT OPINION				=	
6.				=	
7.				=	
8.				=	

List of generalizations about computer advertisements and techniques

Appendix, cont'd

AD #1 Practice recognizing advertising techniques by underlining them in the ad below and then listing below it the techniques used.

Ms. Sensible is doing the best she can to keep on top of things at home and at work. She keeps all her bills, checks, recipes and stock market reports on her personal SMEDLEY computer. She helps her children with their homework and her husband with his tax accounts by using SMEDLEY and SMEDSCHOOL software programs. The SMEDLEY costs $1,499 at all Future Stores. Don't be left out! Help your family by buying one today!

AD #2

Practice recognizing advertising techniques by underlining those you find in the ad below. List the titles of the techniques used.

EVERYONE at Hicksdale High is excited ABOUT THE SMEDLEY computer. It's not just your ordinary classroom computer; it is the BEST! It's the teenager's dream - tutoring, homework and reports all done with the push of a button. SMEDLEY software programs have been tested across the nation and chosen by 9 out of 10 schools as the best. New programs come out monthly to help teachers with grades and lesson plans. Linda O'Neal, editor of COMPUTE magazine, recommends SMEDLEY over other brands. The "Buy 4 - Get One Free" offer is good 'til July 30th. Remember, the schools who care about their students buy SMEDLEY.

The worksheet outlined below can be used to analyze the ads for computer hardware which appear in magazines and newspapers. Have students attach ads before handing in!

Analyzing Ads/Worksheet

Study the computer ad and answer the questions below.

1. Which computer is being advertised?
2. Is the computer designed for business, home or school use?
3. If it's designed for education, is it designed for student use, teacher use or office use?
4. What are the advantages of owning this computer?
5. What first caught your attention?
6. What are the most important words (key words) in the ad?
7. Is the picture an important part of the ad? Why?
8. Does the advertiser have a slogan or special symbol? If so, what is it?
9. Is the price given? Why or why not?
10. Looking over the list of advertising techniques, which techniques would you say this ad uses?

Technique	Your Proof (words from ad)
a.	
b.	
c.	

Students will be more successful if time is spent on each advertising technique prior to the lesson plan. Try using other products first- cars, clothing, food, etc.- which are more familiar to students.

Advertising Techniques

1. STRAIGHTFORWARD AD: name, price, what it does, where you purchase it
2. SPECIAL OFFER: coupon, prizes, or contest go along with purchase
3. EYE APPEAL: how good looking the product is
4. HAPPY FAMILY APPEAL: Happiness and good health will result by using the product.
5. EXPERT OPINION: Someone who should know if product is good tells about it: baseball player for bats.
6. FAMOUS PEOPLE: well-known personality advertises product
7. BANDWAGON: Everyone is using this; don't be left out.

Appendix, cont'd

8. SNOB APPEAL: Only certain people can afford this product.

9. YOUTH APPEAL: Sell to young people or persons who want to be young.

10. SYMBOLS: easily recognizable sign or slogan

11. SOMETHING NEW: new or improved product

12. HUMBLE APPROACH: doing the best you can

13. STATISTICS: figures and percentages from studies to give a scientific air to the product being advertised

14. ECOLOGY/PUBLIC SERVICE: concern for environment, health and safety; good things company does in these areas or that the product can do

15. SEX APPEAL: beauty

16. HUMOR: good feelings/funny joke

17. NOSTALGIA: the good old days product can be as good as it was then; or a total improvement of products then

18. CREATING A MOOD: makes you have special feelings towards the product or time of the year

19. NATURAL OR REAL THING APPROACH: (Could be part of Snob Appeal, but not necessarily.) natural or healthful aspects touted; or the original or genuine qualities promoted

16 Brand names, lettering samples, color guide

PARTIAL LIST OF BRAND NAMES

APPLE	COMPASS	IBM	SHARP
ATARI	DEC	MONROE	SONY SMC-70
ATTACHE	DIGITAL EQUIPMENT CORP.	NEC (ASTRA)™	TEXAS INSTRUMENTS
BMC	FRANKLIN	OLIVETTI	TOSHIBA
BURROUGHS	HEWLETT-PACKARD	PANASONIC	VICTORS
CANON	HITACHI	RADIO SHACK-TRS-80	XEROX R
CASIO	HONEYWELL	ROCKWELL	ZENITH
COMMODORE (PET)	IBEX	SEIKO	

Students may be able to add to this list from their picture or articles file. They will need to begin to look at the way manufacturers have designed their name-style of lettering, use of color, style of logo or use of symbols - to communicate a feeling or idea.

To give students a clearer idea of what to look for, a color guide and lettering styles are given on the next page for use in developing study sheets or worksheets. Start by analyzing familiar products.

COLOR

The color guide below gives the emotional responses usually associated with certain colors. For younger students you'll want to simplify the chart and translate it into general terms.

COLOR	GENERAL APPEARANCE	OBJECTIVE IMPRESSIONS	SUBJECTIVE IMPRESSIONS
RED	BRILLIANT, INTENSE	PASSIONATE, EXCITING, ACTIVE	INTENSITY, RAGE
ORANGE	BRIGHT, LUMINOUS, GLOWING	JOVIAL, LIVELY, ENERGETIC	HILARITY
YELLOW	SUNNY, RADIANT	CHEERFUL, INSPIRING, VITAL	HIGH SPIRIT
GREEN	CLEAR, MOIST	QUIETING, REFRESHING	DISEASE, TERROR
BLUE	TRANSPARENT, WET	SUBDUING, MELANCHOLY SOBER	GLOOM FURTIVENESS
PURPLE	DEEP, SOFT	DIGNIFIED, POMPOUS, MOURNFUL	LONELINESS
WHITE	SPATIAL - LIGHT	PURE, CLEAN, FRANK, YOUTHFUL	BRIGHTNESS OF SPIRIT, NORMALITY
BLACK	SPATIAL - DARKNESS	FUNERAL, DEADLY	NEGATION OF SPIRIT, DEATH

LETTERING

Different styles of lettering are given here to show the variety available in creating their own design.

1.

FOR COMICS OR CARTOONING

2.

FOR SIGN WRITING

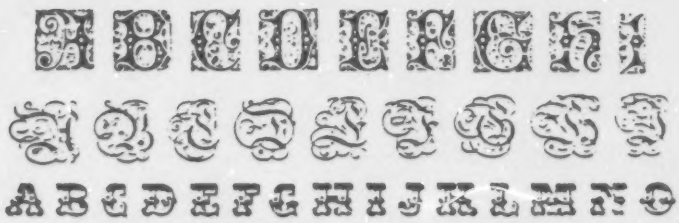
3.

FOR MAKING LOGOS

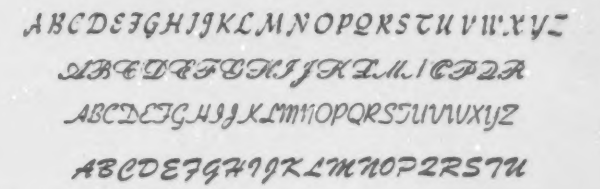
Appendix, cont'd

For students interested in creating a certain image for their lettering design, a book on the various kinds of type classifications may be helpful. A sampling of some of them is given below.

DECORATIVE



CURSIVE



MODERN

abcdefghijklmnopqrstuvwxyz

abcdefghijklmnopqrstuvwxyz

abcdefghijklmnopqrstuvwxyz

abcdefghijklmnopqrstuvwxyz

GOTHIC

abcdefghijklmnopqrstuvwxyz

abcdefghijklmnopqrstuvwxyz

ABCDEFGHIJKLMNOPQRSTUVWXYZ

SANS SERIF

abcdefghijklmnopqrstuvwxyz

ABCDEFGHIJKLMNOPQRSTUVWXYZ

ABCDEFGHIJKLMNOPQRSTUVWXYZ

abcdefghijklmnopqrstuvwxyz

SQUARE SERIF

abcdefghijklmnopqrstuvwxyz

abcdefghijklmnopqrstuvwxyz

abcdefghijklmnopqrstuvwxyz

abcdefghijklmnopqrstuvwxyz

abcdefghijklmnopqrstuvwxyz

Older students may enjoy lettering projects and the use of stencils. Younger students will need to practice by using graph paper. Commercial letters with adhesive backs are available at art and stationary stores. This may be a preferable option for many reasons.

BRAND NAMES

Students should remember the advertising techniques from pages 76 and 77 also as they begin to look at how advertisers have developed brand name designs. Some computer brand names are given here as a beginning. Real samples will show color usage.

Radio Shack

IBM

XEROX

XEROX®

COMPUTER DESIGN PLANNING WORKSHEET

STUDENT(S) _____

1. Name at least 4 kinds of problems (or information) you would like to manage with a computer.

_____ _____

_____ _____

(★ the one you select) _____

2. Who would use the computer?

___ children ___ teenagers ___ parents

___ grandparents ___ business people

___ _____ ?

3. Where would they use it mostly?

___ home ___ office ___ school

___ _____ ?

4. For 5 minutes, write ALL possible names for this computer!

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

★ Select one name = _____

Why did you choose it? _____

5. What colors seem best to match the computer's purpose, user and name? _____ _____

6. What symbols or designs come to mind when you think about this computer?

_____ _____ _____

SKETCH and LABEL SOME PICTURES YOU COULD USE AS A LOGO:

(★ the one you would most like to use)

7. Try different styles of lettering for the name.

STOP Get the teacher's signature BEFORE going to page 2.! _____

PLANNING WORKSHEET, page 2

Use the space below to develop a rough draft design for your computer brand name and symbol/logo.

- Pencil or black and white here:
- Add color now:

1

3

STOP Get teacher comments and approval before doing the final design:

2

4

STOP Have at least 2 other students give suggestions for improvements.

STUDENTS GIVING CRITIQUE:

- MAJOR SUGGESTIONS or COMMENTS:

5

FINAL DESIGN

The final designs could be displayed or developed for use in Activity #17.

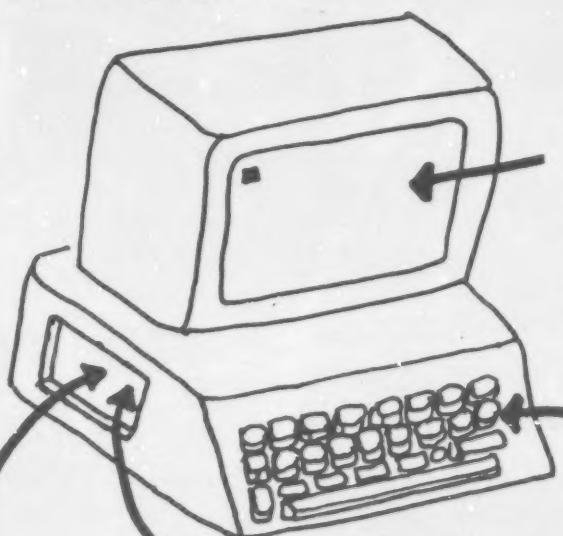
Appendix, cont'd

17 Assembling directions, picture, keyboard

THE COMPUTER

ITS PARTS AND FUNCTIONS

Name _____



4. Display Screen

1. Keyboard

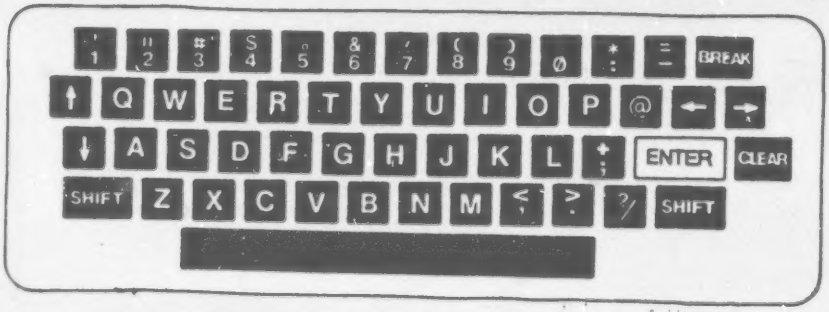
2. Memory (inside)

3. C.P.U. (inside)

(central processing unit)

If by this point in the lesson plan series students have not yet touched a real computer, now is a good time! If a retail dealer or parent can give a demonstration, students will see the computer perform most of the functions.

Students can use their Activity #16 Design Planning Worksheets to help them choose paint color and to personalize the finishing touches on their model.



THE KEYBOARD

This keyboard (TRS-80) is the correct size for the soup box model described on the next page.

As options, you can duplicate other brands' keyboards or have students draw their own.

MATERIALS TO ASSEMBLE

- Each student needs:

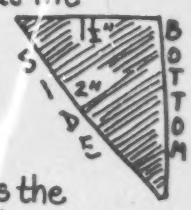
___ 1 "Cup-a-Soup" box (Lipton?) = C.R.T./Monitor
___ 1 Dry Soup Mix box (" ?) = Computer
___ 1 Small white nut cup or condiment cup = Memory (inside)
___ 1 1" Red construction paper heart = C.P.U. (inside)
___ 1 Bobby pin or 3" piece of flexible wire to hold up heart
___ 1 4½" x 3" piece of green construction paper = Green Screen
___ 1 copy of computer Keyboard

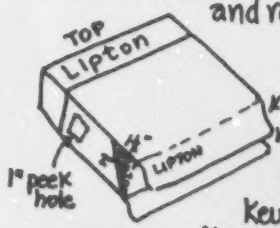
- Other supplies and equipment
  - Scissors -X-ACTO Knife to open box bottom
  - rulers to measure screen
  - thin marker or pen to write message on screen
  - Elmer's glue for screen and Keyboard
  - Tape - Stapler
  - Paint for outside of computer (Darker colors)
  - Paintbrushes and water containers

DIRECTIONS

A. THE COMPUTER (THE SOUP MIX BOX!)

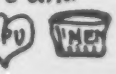
1. Open the bottom of the box CAREFULLY so that flaps are NOT destroyed!! (X-ACTO!!)
2. If top of box was opened, glue it shut to its original position.
3. With scissors, cut a triangle at the bottom of each side of the box and remove them.





This allows the box to slant like a keyboard when the bottom flaps are folded in.

4. Staple lower flap to bottom inside box to make it lay flat. (2-3 staples)
5. Cut small peek hole in one side of box (1" square) so you can see C.P.U. and memory.
6. Write the letters "C.P.U." on the heart and "Memory" on the side of the nut cup.



DIRECTIONS

A. THE COMPUTER (THE SOUP MIX BOX!) cont.

B. THE C.R.T. MONITOR

(THE CUP-A-SOUP BOX!)

1. Glue or tape the box closed.
2. Paint the box and let dry. (Two coats for lighter colors.)
3. Draw a cursor (□) and an appropriate computer message on your 4½" x 3" piece of green construction paper screen.
4. Glue green screen to monitor leaving even borders around it.
5. Glue monitor to top of computer.

7. Tape the heart to the bobby pin or wire. Bend wire at 45° angle so heart will "stand up" and be visible from peek hole. Tape wire to inside of box floor so heart can be seen from hole.

8. Make a loop of tape with sticky side out. Put it on bottom of memory nut cup and put cup inside computer, sticking it to the box floor so that it's visible from peek hole.

9. Fold remaining upper flap in half lengthwise and inward. Tape or glue it down to form the base for the keyboard.

10. Paint the computer. Two coats will be needed if a light color is used.
11. Glue the keyboard picture to the slanted edge of the computer.
12. Students may want to make a brand name and logo plate (Activity # 16) to attach to their computer. ★

18 Planning sheets, peer evaluation sheet

WHAT I LEARNED...

ABOUT COMPUTERS

1. How to write programming directions and find "bugs"
2. How local businesses use small computers
3. Which careers seem to use computers
4. Names and functions of 4 major computer parts
5. How to write and plot a graphics program, etc.

...

OTHER SKILLS

1. How to write directions that work
2. Collecting info. onto charts
3. How to interview someone on the phone
4. Practical math story problems
5. Writing a letter of inquiry
6. making grid designs using coordinates, etc.

...

Students can identify from completed lists some of the following or others:

- MOST FUN
- MOST IMPORTANT
- NOT INTERSTING
- WOULD LIKE TO TEACH TO OTHERS

This becomes the information for the "What to Teach" column of the planning sheets.

POSSIBLE "SHOWS"

1. "Computers to the Rescue"
   (Walking, talking computers rescue humans from business, home and school problems.)
2. "Be Like a Computer"
   (Morton is a muddled thinker and problem-solver UNTIL he uses the 4 computer functions as a model...)
3. "The Case of the Invisible Computer"
   (Sherlock Hemlock and Dr. Watlock hunt for computers in the home uncovering ways to recognize computer "clues.")
4. "My Aunt Margie and Her Computer"
   (Computer history and the family tree. How are they alike?)

PLANNING SHEETS for "THE GREAT COMPUTER SHOW"

Name _____

People To Teach	What To Teach	How To Teach Ideas
• Younger Students		
• Students (same age)		
• Older Students		
• Parents		
• Others in the Community		

Chosen Topic and ideas:

THE DETAILS

WHAT WE'LL DO

IDEAS FOR THE SCRIPT

HOW WE'LL FIND OUT IF AUDIENCE HAS LEARNED COMPUTER INFO.

STOP Get others to critique your idea and give suggestions.

STOP Teacher signature _____

CONTENT/CALENDAR CHART

Presentation Date	Audience(s)	Group	Content / Title
NOV. 6 (2:00)	(Mrs. Orlando's 3rd Grade)	1 Mike Debby Leon Kris Jen	"The Old Woman in a Shoe Using Computers"
NOV. 12 (1:30)	(Community Center)	2	"Computers are Easy"
NOV. 14 (10:00)	(La Mariposa Senior Citizens)	3	"Let's Make a Deal"
NOV. 19 (1:30)	(Markham Jr. High)	4	"The Case of the Missing and Invisible Computer"
NOV. 21		5	

PEER EVALUATION SHEET

Presentation Title _____

- What to Teach: _____
  1. _____
  2. _____
- How to Teach: _____
- Audience — young — Adult
  — _____

+ Great
o okay
– not so good, needs practice

	RATING	COMMENTS
1. Group well-organized and worked well together		
2. Spoke clearly and loud enough to hear.		
3. Audience easily learned computer information.		
4. Presentation was appropriate and interesting to audience.		
5. Creative ideas in "How to Teach"		
6.		
	OVER RATING	

Evaluator _____

For younger students, you can write a script. If time is short, the whole class can participate in 1 presentation!

SCRIPT WRITING

Group* members:

Great Computer Show Title _____

Date of Presentation: _____ Audience _____

What to Teach: (Computers)

How to Teach:
- ___ mystery
- ___ Myth
- ___ Fairy Tale
- ___ Comic Show
- ___ _____

Characters
1)
2)
3)
4)
5)

Props or Costumes

SCRIPT WRITING, Page 2.

Scene 1

Setting:

(if needed, continued to p. 3 ↓)

Scene 2

Setting:

Resources

Resource Materials for "Next Steps"

The next step for you may involve trying to find other sources of materials and ideas to develop more lesson plans or teaching units. The materials listed here are a starting place--only a sample of those available. A short description is included under each one to help you focus on those materials which seem to fit the kind of step you want to take next. They are grouped in the following four categories:

- Computer Books and Articles for Students and Adults
- Books and Materials for Improving Teaching Strategies
- Computer Magazines for Teachers
- Other Resources and Sanity-Savers

As with all "recommended" materials, some will be more helpful than others. The catalyst is your creativity and imagination in adapting them to your needs and to the needs of your students. Explore and enjoy!

Computer Books and Articles

1. Ball, Marion, What Is A Computer?, Houghton Mifflin Company, New York, 1972.
   An illustrated, readable, factual book about the computer.

2. Bell, Marion J., and Charp, Sylvia, Be A Computer Literate, Creative Computing Press, Morris Plain, New Jersey, 1979.
   An introduction to computers for upper elementary through junior high students.

3. Bitter, Gary, "The Road to Computer Literacy: A Scope and Sequence Model," Electronic Learning magazine, September-February, 1982-83.
   A five-part series of articles giving suggested topics and activities by grade level for computer awareness and programming.

4. Chasen, Shelley, and Cohen, Sylvia B., Basic Computing, Book D, Scholastic Book Services, New York, 1984.
   For fourth grade students, this workbook is part of a six-book series designed to teach children the prerequisite concepts and skills for using computers. Particularly good are the lessons on flow charting/problem solving. Teacher's edition available.

5. Computer Literacy: Computers Past and Present, Tandy Corporation, (Radio Shack--TRS-80), Fort Worth, Texas, 1982.
   This package of ditto masters was supposedly sent to every school in the United States. Look around your school and see if you can locate it. If not, call your local Radio Shack retail store and see if they can get you the package of materials made available in March called "America's Educational Challenge."

6. Computer Literacy Curriculum Guide--Grades K-9, T.I.E.S. (Total Information Educational Systems), Minnesota School Districts Data Processing Joint Board, 1982.
   This 55-page document gives rationale, objectives by grade level, implementation issues and curriculum guidelines for educators.

7. Computer Literacy Show and Tell Kit, Sterling Swift Publishing Company, Manchacha, Texas, 1980.
   This is a binder of "show and tell" materials. Actual samples of hardware--abacus, punched cards, magnetic tape, disks, transistors, circuit boards, etc.--are laminated onto cardboard pages with printed descriptions.

8. D'Ignacio, Fred, Katie and the Computer!, Creative Computing Press, Morristown, New Jersey, 1979.
A storybook adventure introducing computers to very young children.

9. Doerr, Christine, Microcomputers and the 3r's, Hayden Book Company, Inc., Rochelle Park, New Jersey, 1979.
This book is for the computer novice to acquaint him with the wide range of computer applications that can be implemented at the secondary level and how to get started.

10. Horn, Carin E., and Collins, Caroll L., Instruction Manual to accompany Computer Literacy, Problem-Solving with Computers, Sterling Swift Publishing Company, Austin, Texas, 1981.
Designed to go with the text of the same name by Horn and Poirot, this manual is a veritable "almanac" packed with supplemental information--facts, summaries of issues and lots of things to do. It is a stand-alone resource in its own right for developing teaching activities of all kinds relating to computers.

11. Moursund, David, Precollege Computer Literacy: A Personal Computing Approach, International Council for Computers in Education, 135 Education, University of Oregon, Eugene, Oregon. ($1.50)
This booklet gives a historical overview of computing and literacy and suggests ways in which the computer can be useful to students in school.

12. Papert, Seymour, Mindstorms, Basic Books, Inc., New York, 1980.
This is a book about children, computers, and powerful ideas. A developer of the LOGO programming language, Papert discusses thinking and problem-solving models as an approach to learning.

13. Poirot, James L., Computers and Education, Sterling Swift Publishing Company, Austin, Texas, 1980.
A short paperback (88 pages) designed to familiarize teachers and administrators with the use of the computer in education.

14. Rice, Jean, and Haley, Marien, My Computer Dictionary, T.S. Denison and Company, Minneapolis, Minnesota, 1981.
Aimed at primary grades to tell the history of computers, how they are helpful, and what a program is. Best read aloud. Teacher's guide and activity book also available.

15. Richman, Ellen, Spotlight on Computer Literacy, Random House, Inc., New York, 1982.
A student workbook adaptable for grades 5-12; activities for both literacy and programming. Well-designed, well-written and easy to use. Excellent graphics and illustrations. Teacher's edition also available.

16. Smith, Brian Riffin, Usborne Guide to Computers, Usborne Publishing, Ltd., London, England, 1981.
A colorful guide to computers, their history and what they do.

17. Thomas, James L., Microcomputers in the Schools, Oryx Press, Phoenix, Arizona, 1981.
A selection of articles from journals covering the major topics and questions frequently asked about selection, development, applications, trends, and issues of instructional computing.

Resources, cont'd

18. Willis, Jerry, and Danley, Jr., William, Nailing Jelly to a Tree, Dilithium Press, Beaverton, Oregon, 1981.
For the person who has a personal computer and a novice's operating skills, this book's focus is on software--using and adapting computer programs available in books, magazines and commercial vendors.

19. Willis, Terry, and Miller, Merl, Computers for Everybody, Second Edition, Dilithium Press, Beaverton, Oregon, 1983.
A general overview of computers; home, business, education--factual, yet friendly. Good for any prospective buyer/user: parents, grandparents, small business owner, educator, etc.

PROGRAMMING BOOKS FOR YOUNG STUDENTS

The following books, while geared to using a computer, have sections which are adaptable to activities which don't require one.

20. Friedman, Batya, and Slesnik, Twila, Teaching BASIC Bit by Bit, Lawrence Hall of Science, University of California, Berkeley, California, 1981.
A teachers' manual of both on-and-off the computer activities for an eight-day (12-hour) course for young students. Lesson plans include materials, content, goals, prerequisite skills and the activity.

21. Larsen, Sally Greenwood, Computers for Kids, Creative Computing, Morristown, New Jersey, 1981.
For students grades 4-9, there are three versions for programming the following brands of computers--Apple, Atari and TRS-80. There are special suggestions for the teacher.

22. Markle, Sandra, Computer Tutor, U.S.A. Learning Works, 1981.
For students grades 4-6, these are reproducible materials. Other information includes some history and flow charting.

Books and Materials for Improving Teaching Strategies

23. Hunter, Madeline, Prescription for Improved Education, TIP Publications, El Segundo, California, 1976.
    A general introduction to improving instruction via information on student behavior, motivation, practice and independent learning.

24. Joyce, Bruce R., New Strategies for Social Education, Science Research Associates, Inc., Chicago, Illinois, 1972.
    A variety of options for teaching social studies--focusing on the gathering and processing of information--an exciting interactive approach adaptable to local situations for students of all ages.

25. Minnis, Douglas L., and Shrable, Kenneth, Improving Questioning Strategies--Level 1--Teacher's Manual, Search Models Unlimited, San Anselmo, Califonria, 1970.
    A teaching strategy to help children process data at more complex or abstract levels--Bloom, Taba, et al. A process where students collect data onto large retrieval charts and are guided by teacher questions to see relationships and make inferences.

26. Moffett, James, A Student--Centered Language Arts Curriculum, Grades K-13: A Handbook for Teachers, Houghton-Mifflin Company, Boston, Massachusetts, 1968.

A practical wealth of assignments and teaching concepts--which lend themselves to a variety of subjects while teaching language skills. Applicable across the curriculum.

27. Upland School District, Training Materials--Project R.A.I.S.D. (Realizing Achievement through Improved Staff Development), 1978.

These materials are designed to improve teachers' instructional skills by focusing on teaching to an objective, level-of-difficulty, learning theory, a five-step lesson plan model, extending thinking skills, etc.

Computer Magazines for Teachers

At the time this guide is going to press (July, 1983), four magazines have risen to the top of the list for providing reliable, timely information about issues surrounding all brands of microcomupters in the educational setting. With a rapidly changing technology, periodicals represent a viable way to keep current.

Your school may already subscribe to one or be willing to start. You can subscribe by sending a check to the address below for the amount indicated. Prices tend to go up, so be prepared for a small increase. Some have reduced rates for multiple subscriptions to the same address.

1. Electronic Learning
   902 Sylvan Avenue
   Englewood Cliffs, NJ 07632
   Price: $19.00 per year (8 issues)

2. Teaching and Computers (Elem.)
   902 Sylvan Avenue
   Englewood Cliffs, NJ 07632
   Price: $19.00 per year (8 issues)

3. Classroom Computer News
   Intentional Educations, Inc.
   341 Mt. Auburn Street
   Watertown, MA 02172
   Price: $16.50 per year (8 issues)

4. Computing Teacher
   Department of Computer and Information Science
   University of Oregon
   Eugene, OR 97403
   Price: $14.50 per year (9 issues)

Other Resources and Sanity-Savers

Besides printed materials, there are groups of people who meet to support each other as they learn about and use their computers at home, work or school. More formal support exists in the form of in-service training and computer courses from a variety of sources. The sources listed here have the potential of providing help and, at the same time, building a communication network for ongoing sharing and support to save time, duplicated energy, frustration and money. Local resources, while sometimes overlooked, can provide long-term help in the form of "sanity-savers" - the daily "nuts and bolts" strategies for utilizing and managing the computer effectively in the educational setting.

Resources, cont'd

1. The Teacher Next Door

The computer phenomenon is a "grass roots" movement and largely a self-help effort. Teachers' feelings about computers run a wide gamut from the "computer zealot" to the "unbeliever." Find out who in your school knows about or is interested in computers.

Those who know about computers will usually be willing to share their information, opinions and resources. Later, you can share back by trading a magazine article or student activity sheet...this keeps the sharing equal and lessens the task of trying to keep current with the technology for everyone.

If there are no resident computer experts at your school yet, but other teachers are interested in computers, join forces. Form an informal sharing group and divide the "keeping up" tasks. Someone to:

- keep a folder of inservice sessions, workshops and courses.
- find out about hardware - brands, prices, advantages, peripherals, etc....
- keep track of the software catalogues.
- collect software reviews.
- scan educational computing magazines and newsletters for topics of interest.
- serve on the school computer planning committee and the district computer planning committee.

....etc.

Attending computer fairs in pairs or groups and participating in workshops together can help in supporting each other as you try to learn and implement new skills.

Divide and conquer! Share those literacy lesson plans and divide up new units of study for development. Computer applications cross all grade levels and all curriculum areas. Talk to staff members outside your grade level or department about powerful computer uses schoolwide.

2. The School Next Door

Seldom tapped as a resource, a teacher or administrator at another school may be MORE than willing to help and glad that you asked. (Remember to share in return later...) A phone call may help you locate other teachers who are using or getting ready to use a computer. War stories from surviving computer veterans are full of valuable hints of what worked well and what didn't work well. This can save your repeating useless mistakes and give you a bank of helpful hints for getting started.

3. Your Students

Shocked? Brace yourself! Your students may already be more computer literate than you. Capitalize on this resource! Find out who already has a computer at home (or at Grandma's or Uncle Andrew's). Invite them to share with the class what they know and what they can do with computers. Invite them to tutor you or to serve as monitors or peer tutors when a computer becomes available for your classroom.

This role reversal may be a little uncomfortable at first, especially if your teaching style historically assumes that YOU have ALL the answers at the BEGINNING of the lesson and allow for only ONE possible learning outcome for all students. It may help to consider this new role in the light of the following perspectives:

a. Technology changes daily. Alone, we are doomed to running a race we can never win. All help is welcome--and probably necessary.

b. Students have an affinity to computers. The older we are, the more aversion to technology we may have. The younger they are, the freer they are from PAPER addiction in managing information and solving problems. New tools sometimes require a total "rethink" about the problems they can help us solve. Less paper? Not bad!

c. Learning FROM and WITH your students has some very definite payoffs. Marc Roberts, in his book, Loneliness in the Schools, talks about barriers which separate students and teachers. Two of these barriers could be eliminated in this type of partnership:

   - Lack of JOINT success ventures

   - Not knowing enough about the students' world

Learn together about computers. It's one of the few areas where there is sometimes an equal lack of knowledge or a reversal in roles as to who has the most knowledge. Kids are interested in and motivated by computers. Learning about them together could have some very positive side effects on classroom climate.

4. Your Students' Families

An increasing number of parents are using computers in their work situation. As the price of the home and personal computer drops, the frequency of computers purchased for students' homes goes up. Even parents not interested in home computers are convinced that their children need to know about computers and how to operate one to be successful in the job market.

Don't overlook this partnership as a valuable resource. Parent volunteers can help build picture files, magazine and newspaper article files. They can talk to students about how they use computers at their work and at home and give demonstrations. Computers can be another positive link between home and school.

5. School District Assistance

Most districts are involved in some type of instructional computing coordination effort. The degree of commitment varies depending on several factors including: literacy level of decision-makers; relative priority to other local problems or areas of concern, etc. Check to see what resources are available to you or are in the planning stages. Some of them COULD include:

- a district computer committee and planning process
- inservice or training sessions
- a K-12 computer curriculum
- computer-user groups
- computer-related library and media materials
- a full or part-time instructional computing specialist

Again, the computer effort is largely voluntary. If assistance is limited or non-existent, volunteer to help in the organizational tasks even if you don't feel confident yet about your level of literacy. You can learn as you help build a support network.

Resources, cont'd

6. Office of the County Superintendent of Schools

Resources at this level may also vary for some of the same reasons. To locate instructional computing services, call your local office. Depending on the organization of services, instructional computing may be listed under Curriculum, Instructional Services, Media Services or Staff Development. Services may be available at no cost as part of the media contract or on a registration or usage-fee basis. Resources COULD include:

- countywide computer planning or advisory group
- microcomputer lab
- visiting microcomputer bus
- software library
- software evaluation information
- electronic bulletin board
- inservice or training sessions
- computer-related media
- computer books, periodicals and teaching materials
- computer-user groups
- commercial vendor displays/fairs
- a full- or part-time instructional computing specialist
- computer loan or rental program
- computer repair services

Your inquiry may yield lots of resources or very little. Your call may also be the catalyst to start the planning efforts towards those services.

7. T.E.C.C. -- Teacher Education and Computer Center

Other computer services are available to California educators through regional T.E.C.C. centers. Staff development funds are translated into services by local representatives serving on the policy board and the T.E.C.C. staff. These centers are charged with the task of helping teachers improve instruction primarily in the areas of math, science and computers.

The menu of services and resources varies with the region and local needs. It might include some of those services mentioned previously in the lists of possible services from districts and counties. County offices can give you the phone number of your T.E.C.C. center.

8. Colleges and Universities

Besides the traditional computer science and data processing courses, colleges are beginning to offer a variety of classes on instructional computing for educators. Community colleges and extended learning divisions of both state colleges and universities offer computer training opportunities. Registration fees vary greatly - $0 to $200 and up. Check local community college and extension catalogues for course descriptions and fee structures.

9. Other Community Resources —

User Groups and Computer Retail Stores

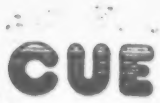
People who use computers soon seek out other people trying to do the same thing. They can do this easily by joining a community "user group." This group is usually an informal club which meets once or twice a month to talk about software, operating problems, programming, new developments and magazine articles. User groups are sometimes sponsored by a local computer store and meet by brand of computer - Apple users; TRS-80 users, etc.

Members of these groups have a broad range of interests in computers (home, business, education, church or organization) and vary in experience from absolute beginner to professional. They come in all sizes, ages and backgrounds. Their enthusiasm, willingness to help, and tolerance for beginners' questions is extraordinary. To locate a local user group, contact some computer stores or look for listings in computer magazines and write for information.

Some retail stores can serve as a resource for information on hardware and software. However, their main purpose is to sell computers so they can stay in business. Not all computer stores cater to educators. Neither do they have sales people who specialize in instructional computing. There are notable exceptions who seek to establish a positive rapport with schools and have excellent track records for on-site assistance and demonstrations, initial inservice, software previewing, and timely and reliable repair service. Seek them out by asking other educators.

10. C.U.E. — Computer-Using Educators

This volunteer organization is made up of educators involved with computers. A description of the group is listed below and a membership form is included on the next page so that it can be duplicated and mailed with your check.



The one-year payment of eight dollars contributes to the publication of a newsletter, the organization of conferences, and the refinement and duplication of public domain (legally copyable) software. As a timely, on-target resource, C.U.E. is a network of other sources of information for the novice to the computer expert. The quality and dollar value are unparalleled.

What is C.U.E.?

COMPUTER-USING EDUCATORS is a non-profit California corporation founded by teachers in 1978 with the purpose of promoting and improving computer use in schools and colleges. CUE has about 5,000 members in 49 states, 4 provinces, and 12 other nations. The organization's main activities are a bi-monthly newsletter, several major conferences per year, and SOFTSWAP, an educational software library and exchange.

Despite its international membership, CUE has chosen to focus its attention on the needs and interests of California educators. Through its affiliation with the International Council for Computers in Education (ICCE), CUE supports that organization's role as the international umbrella group representing educators who use computers. ICCE is the publisher of *The Computing Teacher*, and co-sponsor of the annual National Educational Computing Conference (NECC), held each year in June.

CUE's work is accomplished almost entirely by volunteers. Prices of conferences, newsletters and membership are kept low by a steady stream of willing workers. Participants gain as much as they give to this unusual, supportive, and productive organization, and new people are always welcome to participate. Those interested should contact any of the people mentioned on this page, or the president, Mrs. Bobby Goodson, 1666 Kitchener, Sunnyvale, CA 94087.

Formal responsibility is vested in the 5-member Board of Directors which takes its direction from an informal 20-member executive committee which meets about 8 times per year. Any CUE member is welcome to attend and participate in these meetings, which are Friday potluck dinners held in the Bay Area. Contact Leeann Patterson at (408) 286-7642 for the location of the next meeting.

SOFTSWAP

SOFTSWAP is the CUE exchange of teacher-written public domain educational software. There are currently 58 disks with about 300 programs for the Apple, Atari, Compucolor, PET, and TRS-80. Hundreds of visitors have copied the programs without charge at the SOFTSWAP headquarters in the San Mateo County office of Education in Redwood City and in other regional centers.

Programs are also available via mail order for a nominal charge (see order form on last page of this newsletter). Over 5000 disks have been distributed this way nation-wide and abroad.

The modest income generated is put back into SOFTSWAP to pay student programmers and office help. CUE volunteers evaluate and edit contributed programs, and hardware chairpersons are responsible for the production of the finished disks:

Apple: Bev Saylor and Bev Hamilton
Atari: Pat Tubbs
Compucolor: Marge Fitting
PET: Jim Love and Bunny Dawson
TRS-80: Brian Sakai and Bob Jackson

How can you help?

Send your original program on a disk to the SOFTSWAP address below; you may then request any SOFTSWAP disk of your choice in return. If your school or user's group would like to develop an entire SOFTSWAP disk (see Apple #5 or PET #4, for example) please write for a program standards checklist and release form. These disks will carry the group's logo in addition to SOFTSWAP and will be disseminated with other SOFTSWAP programs.

Please send $1 to the address below for a SOFTSWAP catalog and order form. Other forms are free.

Ann Lathrop, SOFTSWAP Chairperson
Microcomputer Center, SMERC Library
San Mateo County Office of Education
333 Main St., Redwood City, CA 94063

The 1983 Fall Conference will be held on October 6, 7, 8 at Independence High School in San Jose. There are similar C.U.E. conferences held in Northern California and Southern California. Information about them will arrive in your bimonthly C.U.E. newsletter.

Resources, cont'd

Computer-Using Educators
Membership Form

Name _____ Check One

Affiliation _____ ☐ New

Address _____ ☐ Renewal

_____

Dues	U.S.	Canada	Elsewhere	Institution*
One Year	$ 8.00	$ 10.00	$ 18.00	$20.00
Two Years	$ 14.00	$ 16.00	$ 24.00	$ 38.00

Make check payable to: **Computer-Using Educators**

Mail to: C.U.E. Membership, P.O. Box 18547, San Jose, CA 95158

Please: No purchase orders, unless accompanied by check.

**Institution membership defined as one not accompanied by an individual's name.*

There are many other resources - books, magazines, computer specialists, conferences, training sessions... which help you become better informed about computers and other technology-related tools. While participating in this network of computer specialists and "users," you may observe that you operate in three different modes almost simultaneously:

1. STUDENT

   In this mode you are making new contacts, collecting information and materials and learning new skills.

2. SHARER

   You then trade those materials and introduce others to successful resources, groups and events. You begin to put back into the network some of the energy you're taking out!

3. TEACHER

   Add to that network by talking with individuals and/or groups about what you're learning. Pass along those "sanity savers" you've discovered or a lesson plan you've created. Help raise the awareness level of others about the potential of computer-assisted learning and some of the problems that need to be solved.

   This "multiple-mode" nature keeps the network alive and growing and relies on the volunteer, self-help spirit. The rapid pace of a changing technology makes it a necessity. Lend a hand!

Blank Lesson Plan Sheet

After using our lesson plans, we hope you'll develop others to help teach computer awareness. When you gain access to computers, we hope you'll begin to develop lessons to teach the programming and problem-solving strand of computer literacy.

We've included some blank lesson planning sheets for YOUR use. If you are pleased with the results of the ones you develop, we hope you'll share them with educators at your school. Help build the network in your area by organizing a session to exchange computer literacy materials and teaching strategies.

Critique Sheet — Notes to the Authors

As you use this computer awareness guide, your reactions, comments and suggestions are critical information to any future revisions or editions. THINK! EVALUATE! WRITE! MAIL IT TO US! Based on the data we receive from you, we'll be improving these materials and keeping track of interest in another set of lesson plans.

Dear Authors,

I have used the guide and would like to share with you the following reactions. I am currently a _____ (position) at _____ (school) in _____ (city) _____ (state). My students are primarily _____ graders. We have been using the guide for _____ weeks and I have implemented the activities in the following ways: _____

Prior to using the guide, my own computer literacy level was _____. We currently have _____ (#) computers available for the _____ (#) students at our school. There are _____ (#) teachers at our school and _____ (#) of them are teaching about computers.

1. I have used the following lesson plans: # → → → → → → → →
2. The 2 most effective and successful lesson plans were # ___ and # ___ because _____
3. The 2 least effective and successful lesson plans were # ___ and # ___ because _____

I have the following comments and suggestions about the different parts of the guide.

	Design and Format	Content Information	Need more of...	Need less of...
• Introduction				
• Lesson Plans				
• Appendix				
• Resources				

Other comments include:

Computer Awareness Activity

Curriculum Areas

Objectives

How This Activity Relates To Computer Literacy

Teacher Options

Materials

Teacher Preparation

Time

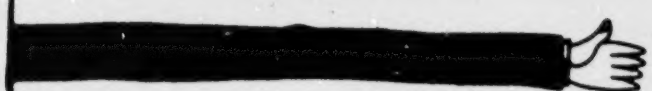
Prior Skills Needed By Students

Teaching Activity

Guided Practice

Independent Activity

Extension Suggestions



Sharing

Evaluation